Vol. 1019 Number 2

OFFICIAL GAZETTE

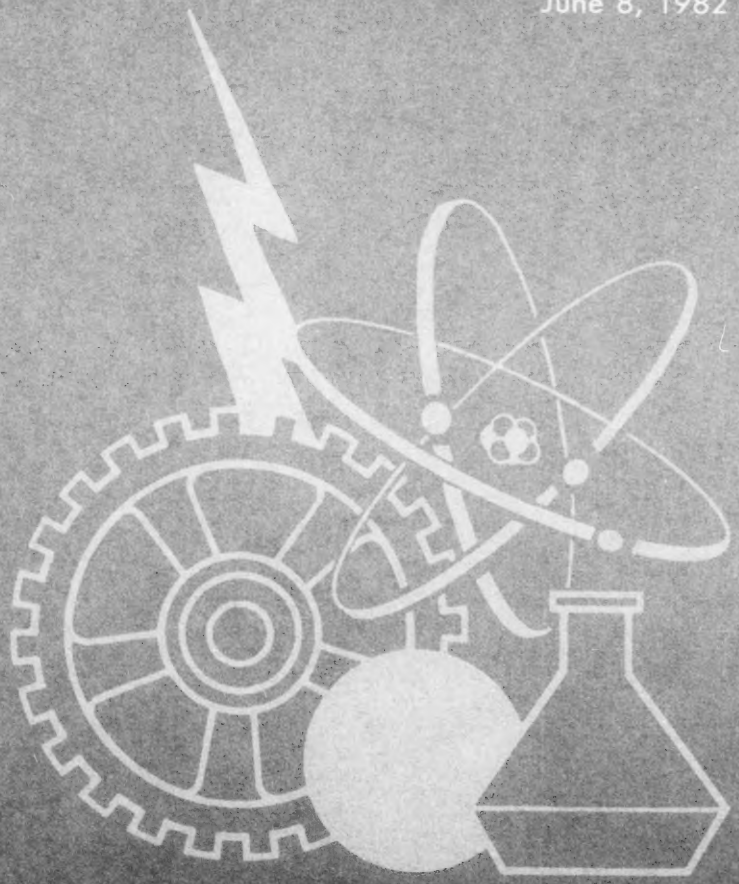
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

June 8, 1982



U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

June 8, 1982 Volume 1019 Number 2

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1019 OG 12
Reissue Applications Filed	1018 OG 12
Requests for Reexamination Filed	1019 OG 12
Erratum	1019 OG 12
Adverse Decisions in Interference	1019 OG 12
Patent Certificates of Correction	1019 OG 14
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1019 OG 15
Condition of Patent Applications	1019 OG 16
Reissue Patents Granted (30,958)	395
Plant Patents Granted (4,855)	399
Patents Granted	
General and Mechanical (4,333,179)	401
Chemical (4,333,730)	587
Electrical (4,334,119)	699
Design Patents Granted (264,765)	771
Index of Patentees	PI 1
Indices of Reissue, Design and Plant Patentees	PI 40
Classification of	
Patents (Including Reissues)	PI 45
Designs and Plants	PI 47
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 48
Designs and Plants	PI 49
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly, subscription $360.00 per annum for first-class mailing, also available as fourth-class mail at $250.00 domestic; $312.50 foreign; foreign first-class mailing rates will be furnished upon request; single copies each, $6.50 domestic, $8.15 foreign.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $205.00 per annum, foreign mailing $256.25 per annum; single copies $5.00 each domestic, $6.25 foreign.

GENERAL INFORMATION concerning PATENTS, price $2.50 each.

GENERAL INFORMATION concerning TRADEMARKS, price $2.25 each.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS AND DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries and the most recent PCT rule changes see the notices appearing in the Official Gazette at 1001 O.G. 14 on Dec. 9, 1980 and at 1012 O.G. 20 on Nov. 17, 1981.

Note that the international fees have been increased as of Jan. 1, 1982. The current schedule of fees is as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Fees	
Basic Fee (first 30 pages)	270.00
Basic Supplemental Fee (for each sheet over 30)	6.00
Designation Fees	65.00

GERALD J. MOSSINGHOFF,
Jan. 19, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,195,868, Re. S.N. 368,649, Filed Apr. 15, 1982, Cl. 366/85, CONTINUOUS MIXER, Bernard Loomans, et al., Owner of Record: *Baker Perkins, Inc., New York, N.Y.,* Attorney or Agent: John F. Learman, et al., Ex. Gp.: 242

3,782,336, Re. S.N. 353,433, Filed Mar. 1, 1982, Cl. 122/379, METHOD AND APPARATUS FOR CLEANING HEATED SURFACES, John E. Nelson, Owner of Record: *The Babcock & Wilcox Co., New Orleans, La.,* Attorney or Agent: Cyrus G. Minkler, Ex. Gp.: 344

4,093,147, Re. S.N. 307,561, Filed Oct. 1, 1981, Cl. 242/159, FLAT NYLON 66 YARN HAVING A SOFT HAND, AND PROCESS FOR MAKING SAME, James E. Bromley, et al., Owner of Record: *Monsanto Co., St. Louis, Mo.,* Attorney or Agent: Kelly O. Corley, et al., Ex. Gp.: 242

4,117,827, Re. S.N. 306,423, Filed Sept. 28, 1981, Cl. 126/121, FIREPLACE CONSTRUCTION, Thomas F. Billmeyer, Owner of Record: *Inventor,* Attorney or Agent: Ernest A. Wegner, et al., Ex. Gp.: 345

4,145,632, Re. S.N. 365,079, Filed Apr. 5, 1982, Cl. 313/330, COMPOSITE SUBSTRATE FOR ROTATING X-RAY ANODE TUBE, Thomas Maurice Devine, Jr., Owner of Record: *General Electric Co., Schenectady, N.Y.,* Attorney or Agent: Marvin Snyder, Ex. Gp.: 256

4,179,967, Re. S.N. 312,360, Filed Oct. 16, 1981, Cl. 83/846, VARIABLE TOOTH SAW BLADE, Calvin M. Clark, Owner of Record: *Capewell Manufacturing Co., Hartford, Ct.,* Attorney or Agent: Vernon F. Kalb, et al., Ex. Gp.: 323

4,190,058, Re. S.N. 351,641, Filed Feb. 23, 1982, Cl. 128/736, DEVICE FOR USE IN EARLY DETECTION OF BREAST CANCER, Zsigmond L. Sagi, Owner of Record: *Arden Industries, Inc., New Jersey,* Attorney or Agent: Richard Whiting, Ex. Gp.: 335

4,194,701, Re. S.N. 360,051, Filed Mar. 19, 1982, Cl. 242/58.3, ROLL STAND WITH MEANS FOR JOINING A WEB TO ANOTHER WHEN UNWOUND FROM ROLLS, Bengt A. Andreasson, Owner of Record: *Ab Amals Mekaniska Verkstad, Amal, Sweden,* Attorney or Agent: Robert B. Murray, et al., Ex. Gp.: 242

4,196,988, Re. S.N. 363,859, Filed Mar. 31, 1982, Cl. 354/33, MANUAL OR AUTOMATIC CAMERA AND ELECTRONIC FLASH FOR USE THEREWITH, Masahiro Kawasaki, Owner of Record: *Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Harold D. Steinberg, et al., Ex. Gp.: 211

4,297,758, Re. S.N. 364,283, Filed Apr. 1, 1982, Cl. 440/10, LIFE PRESERVER OF THE ENCAPSULATED TYPE, Harold J. Moran, Owner of Record: *Switlik Parachute Co., Inc., Trenton, N.J.* Attorney or Agent: Frederick A. Zoda, et al., Ex. Gp.: 315

4,313,645, Re. S.N. 367,188, Filed Apr. 9, 1982, Cl. 339/103M, TELEPHONE CORD HAVING BRAIDED OUTER JACKET, Eugene R. Cocco, Owner of Record: *Western Electric Co., Inc., New York, N.Y.,* Attorney or Agent: S. I. Rosen, et al., Ex. Gp.: 322

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

Re. 29,795, Reexam. No. 90/000,192, Requested: Apr. 27, 1982, Cl. 83/245, SELF-CONTAINED FEED ROLL FOR POWER PUNCH PRESSES, Harry Eyberger, Owner of Record: *Requester,* Attorney or Agent: Price & Adams, Ltd., Ex. Gp.: 323, Requester: Vamco Machine & Tool, Inc., Pittsburgh, Pa.

4,157,968, Reexam. No. 90/000,175, Requested: Mar. 12, 1982, Cl. 210/489, FILTERS, Dirk G. Kronsbein, Owner of Record: *Ultra Filters, GMBH, Dusseldorf, Fed. Rep. Germany,* Attorney or Agent: Toren, McGeady & Stanger, Ex. Gp.: 170 Requester: Vincent L. Ramik, Washington, D.C.

4,285,380, Reexam. No. 90/000,196, Requested: May 6, 1982, Cl. 411/103, PANEL FASTENER, Bulent Gulistan, Owner of Record: *VSI Corp., Pasadena, Calif.,* Attorney or Agent: Christie, Parker, & Hale, Ex. Gp.: 355, Requester: Rexnord, Inc., Legal Dept., Milwaukee, Wis.

Erratum

In the Requests for Reexamination Filed, appearing in the May 18, 1982 Official Gazette (1018 OG 20), the Reexam. No. for 4,219,126 should be 90/000,190.

Adverse Decisions in Interference

In the designated interference involving the indicated claims of the following patents, final decisions having

been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,794,703, T.M. Beck, R.J. Eletto and D.J. Martin, PROCESS FOR THE PURIFICATION OF DIALKYL PHOSPHOROCHLORIDOTHIONATES, Interference No. 100,185, decided Nov. 23, 1981, claims 1 and 2.

Patent No. 3,956,103, G.J. Antos, HYDROCARBON CONVERSION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE, Interference No. 99,634, decided Dec. 21, 1981, claims 10 and 15.

Patent No. 3,969,071, B. Hugelin, NEW CARRIERS AND THEIR USE IN PRINTING AND DYEING, Interference No. 100,618, decided Mar. 24, 1982, claims 1-3, 5, 9-12.

Patent No. 4,000,985, R.B. Orelup, AZO DYES HAVING A HIGH SOLUBILITY IN PETROLEUM FUELS, Interference No. 100,018, decided Feb. 2, 1981, claims 16 and 20.

Patent No. 4,047,355, W.L. Knorr, SHAFTWALL, Interference No. 99,853, decided Mar. 18, 1981, claims 1-5, 8, 11-14.

Patent No. 4,155,955, C.R. Parks, CHEMICALLY BOUND ANTIOXIDANTS, Interference No. 100,644, decided Oct. 1, 1981, claims 1 and 2.

Patent No. 4,168,618, M. Saier, H.W. Kastner and R. Klockler, Y AND T-FINNED TUBES AND METHODS AND APPARATUS FOR THEIR MAKING, Interference No. 100,583, decided Feb. 1, 1982, claims 1-6, 8, 17, 21, 26, 27, 29 and 35.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent Interferences.

PATENT NOTICES

Certificates of Correction for the Week of June 8, 1982

Re. 30,584	4,293,184	4,307,544	4,317,629
3,641,239	4,294,836	4,308,254	4,318,038
3,965,105	4,294,837	4,309,226	4,318,058
4,038,345	4,295,636	4,309,626	4,318,544
4,115,356	4,296,066	4,309,650	4,319,141
4,126,349	4,297,362	4,309,668	4,319,146
4,160,914	4,297,363	4,309,762	4,319,222
4,186,791	4,297,671	4,310,248	4,319,255
4,190,298	4,297,679	4,310,661	4,319,509
4,191,566	4,298,748	4,311,157	4,319,601
4,207,221	4,299,500	4,311,322	4,319,634
4,210,581	4,299,573	4,311,644	4,319,638
4,220,265	4,301,290	4,311,703	4,319,874
4,234,232	4,301,756	4,312,155	4,320,869
4,238,456	4,301,804	4,312,759	4,321,136
4,250,322	4,302,113	4,312,945	4,321,145
4,263,428	4,302,406	4,313,014	4,321,253
4,264,532	4,302,620	4,313,107	4,321,305
4,264,612	4,302,809	4,313,193	4,321,397
4,268,442	4,303,657	4,313,737	4,321,562
4,269,438	4,303,797	4,314,612	4,321,789
4,271,374	4,304,100	4,314,934	4,321,942
4,271,410	4,304,173	4,315,254	4,322,094
4,273,089	4,304,259	4,315,292	4,322,562
4,278,751	4,304,339	4,315,461	4,322,638
4,282,333	4,305,328	4,315,546	4,322,761
4,284,053	4,306,049	4,315,744	4,322,854
4,284,705	4,306,079	4,315,977	4,322,870
4,288,956	4,306,091	4,316,364	4,322,934
4,291,213	4,306,308	4,316,383	4,323,083
4,292,961	4,307,110	4,317,172	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 222
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2865
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 3, 1982

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-23-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-04-80
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-04-81
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-16-81
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	2-08-81
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	8-26-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	8-05-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-05-80
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	12-07-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-26-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	5-15-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-11-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	10-01-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	5-29-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	10-22-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	7-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1982, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,176,314 to 3,181,174, inclusive

Plant Patents ..... Numbers 2,490 to 2,501 inclusive

REISSUES

JUNE 8, 1982

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,958

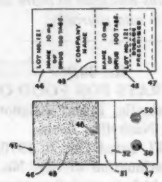
PACKAGE LABEL AND MANUFACTURE OF SAME

Rollin T. White, Westfield, N.J., assignor to NJM, Inc., Fairfield, N.J.

Original No. 4,128,954, dated Dec. 12, 1978, Ser. No. 776,534, Mar. 11, 1977. Application for reissue Sep. 25, 1980, Ser. No. 190,560

Int. Cl.[3] **G09F** *3/00;* **A61F** *13/02;* **B32B** *3/14, 7/06*

U.S. Cl. 40—310 **10 Claims**



1. The article which comprises a container for a product having a label bearing surface portion, and a label proper on such container comprising an unfolded sheet of label paper overlying said container surface portion as a single layer, said sheet being weakened transversely to provide two sections separable from one another, each of said sections having provided on its face side information relating to the particular product packaged in the container, a first of said sections having on its back side an adhesive permanently affixing said first section to the container, the second of said sections having on a first portion of its back side an adhesive removably affixing said second section to the container, whereby both of said sections hold the unfolded label sheet as a whole on the container in a form conforming to the shape of the container surface covered thereby, a pressure sensitive adhesive on a second portion of the back side of said second section *adjacent to said transversely weakened portion of the label sheet* and a second layer of material having a release coating thereon and covering said pressure sensitive adhesive to render the latter adhesively inoperative while said second label section is adhered to the container, said second layer being removable when said second label section is detached from the container and said first label section to render the pressure sensitive adhesive operative to adhere the back of the detached second label section to another article.

Re. 30,959

SCHEDULING BOARD

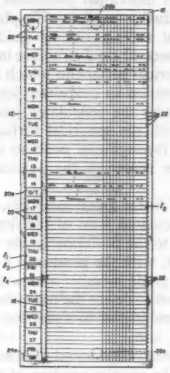
John S. Anderson, and Virginia B. Anderson, both of Manor Hill Farm, 4600 Breidenbaugh La., Glenarm, Md. 21057

Original No. 4,003,150, dated Jan. 18, 1977, Ser. No. 668,576, Mar. 19, 1976. Application for reissue Jan. 3, 1979, Ser. No. 679

Int. Cl.[3] **G09F** *3/20*

U.S. Cl. 40—374 **14 Claims**

9. A scheduling board for providing a visual listing comprising: a planar board of rigid material having a planar outer face, means providing the planar outer face a relatively narrow-width slideway, a plurality of discrete planar tabs having top and bottom edges arranged in column formation in said slideway with said edges disposed in abuttable relationship, said tabs being inscribable with indicia on their outer planar faces, means providing on the planar outer face of said board a channel of substantially greater lateral dimension than that of said slideway with one side proximal to and parallel with said slideway, a multiplicity of transversely disposed elongated semi-rigid strips slidably disposed in top-to-bottom relationship in said channel, said strips being inscribable with indicia on their outer faces, the vertical height of said strips being a known fraction of the vertical height of any one of



said tabs whereby the total vertical height of a plurality of said strips equals the vertical height of one or more tabs, and means retaining both the tabs and the strips in vertically slidable engagement on the outer face of the board.

Re. 30,960

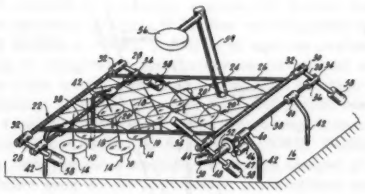
CENTRAL RECEIVER SOLAR COLLECTOR USING MECHANICALLY LINKED MIRRORS

Warren T. Sommer, 3137 N. Cramer St., Milwaukee, Wis. 53211

Original No. 4,102,326, dated Jul. 25, 1978, Ser. No. 837,181, Sep. 28, 1977. Application for reissue Jul. 23, 1980, Ser. No. 171,648

Int. Cl.[3] **F24J** *3/02;* **G02B** *5/08*

U.S. Cl. 126—424 **22 Claims**



1. A solar radiation collector utilizing mechanically linked mirrors to provide radiation concentration, comprising:

(a) a radiation receiver,

(b) a first rigid structure substantially greater in dimensional extent in at least one dimension than the [dimentions] *dimensions* of the radiation receiver, the first rigid structure being generally fixed with respect to the radiation receiver at a position displaced from the radiation receiver along a line normal to the directions of major dimensional extent of the first rigid structure,

(c) a first plurality of articulated joints carried by the first rigid structure, the joints allowing free rotation in any direction within a substantial range of angular positions,

(d) a plurality of mirrors, each mirror being coupled to and

rotatable about an individual joint of the first plurality of articulated joints so that, when properly oriented, each of the mirrors may reflect radiation from a radiation source onto the radiation receiver,

(e) a second rigid structure which is translatably movable in three mutually perpendicular directions with respect to the first rigid structure, with the motion being constrained so that each point on the second rigid structure generally moves over a spherical surface particular to that point,

(f) a plurality of positional guides carried by the second rigid structure, each individual positional guide being paired with an individual joint of the first plurality of articulated joints [in that each positional guide is disposed with respect to the second rigid structure in such a way that the particular spherical surface to which a positional guide is constrained contains an articulated joint of the first plurality of joints, with the articulated joint positioned at the intersection with the spherical surface of a straight line which passes through the position of the radiation receiver and the center of the particular sphere of constraint],

(g) a plurality of linear guide members, each coupled to an individual articulated joint of the first plurality of joints and extending to the positional guide associated with that particular joint, with the positional guide slidably engaging the linear guide member and with each linear guide member adapted to orient the individual mirror associated with that particular joint to a position normal to the linear guide member, and

(h) means for moving the second rigid structure, in response to changes in the angular position of the sun, so that each positional guide lies along a line which passes through the center of the particular sphere of constraint for that positional guide and is aligned *generally* in the direction of the sun.

Re. 30,961

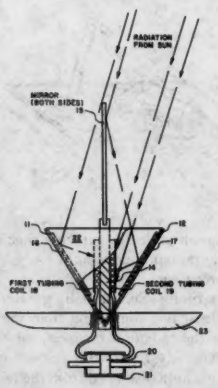
SOLAR-ENERGY-POWERED SUN TRACKER

Roland W. Robbins, 825 E. California Blvd., Ridgecrest, Calif. 93555

Original No. 4,027,651, dated Jun. 7, 1977, Ser. No. 658,544, Feb. 17, 1976. Continuation of Ser. No. 26,037, Apr. 2, 1979, abandoned. Application for reissue Jul. 7, 1980, Ser. No. 166,336

Int. Cl.[3] **F24J** *3/02*

U.S. Cl. 126—425 **12 Claims**



10. Apparatus for tracking a radient energy source such as the sun, comprising:

at least one radient energy sensing means mounted so as to rotate on at least one axis with respect to said source so as to be able to track said source;

said energy sensing means each comprising at least a first and second energy collector/convertor means mounted in spaced relation to each other;

means associated with said first and second collector/convertor means effective to create a difference in the amount of radiation received by said first and second collector/convertor means respectively when said apparatus is pointed toward said source at other than boresight;

each said collector/convertor means including a fluid containing reservoir wherein a vapor pressure is created when said reservoir is receiving radient energy and said pressure created is in proportion to the radient energy received; and

fluid motor means connected to said reservoirs translating vapor pressure of said reservoirs respectively into movement of said apparatus when a vapor pressure differential exists between said reservoirs;

whereby the apparatus will tend to move toward boresight position with respect to said source.

Re. 30,962

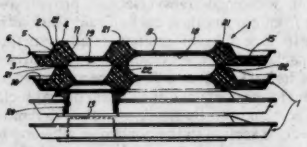
INSULATED TRAYS FOR FOOD OR THE LIKE

John A. Bridges, Nashville, Tenn., assignor to Aladdin Industries, Incorporated, Nashville, Tenn.

Original No. 3,532,247, dated Oct. 6, 1970, Ser. No. 837,979, Apr. 28, 1969. Continuation of Ser. No. 690,654, Dec. 14, 1967, abandoned, which is a continuation-in-part of Ser. No. 672,219, Mar. 30, 1967, abandoned. Application for reissue Jul. 20, 1979, Ser. No. 59,396

Int. Cl.[3] **B65D** *1/26, 21/04*

U.S. Cl. 220—23.6 **10 Claims**



11. An insulated food service system comprising a multiplicity of stacked insulated trays, each upper surface of each tray being formed to define a plurality of dished receptacles for the reception of food portions, said lower surface of each tray being formed to define a plurality of inverted dished portions under and substantially coextensive with a corresponding dished portion formed in said upper surface to form groups of vertically aligned compartments, one group of said compartments having thin, essentially non-insulating upper and lower walls and thicker insulating side walls so that first food portions of a like temperature may be placed in said one group of vertically aligned compartments and second food portions of a like different temperature may be placed in another group of said vertically aligned compartments whereby a food portion in any intermediate one of said group of vertically aligned compartment has substantial insulation between it and food portions in adjacent compartments but substantially none between it and food portions in compartments above and below it.

Re. 30,963

ATOMIZER WHEEL WITH WEAR-RESISTANT, SINTERED BUSHINGS

Aage Moller, Farum, and Orla Straarup, Birkerod, both of Denmark, assignors to Aktieselskabet Niro Atomizer, Soborg, Denmark

Original No. 3,640,467, dated Feb. 8, 1972, Ser. No. 871,925, Oct. 28, 1969. Application for reissue Apr. 11, 1978, Ser. No. 895,529

Claims priority, application Denmark, Nov. 5, 1968, 5367/68

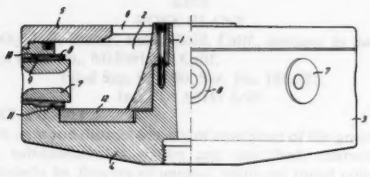
Int. Cl.[2] **B05B** *3/10*

U.S. Cl. 239—224 **7 Claims**

9. In an atomizer wheel for atomization of slurries of highly abrasive materials having: a bowl-shaped wheel with a central hub and a cylindrical outer wall coaxially disposed about said hub and

a bottom part connecting said outer wall with said hub to define an annular chamber; an annular cover member on said outer wall, said cover member having a central opening defining together with said hub an unobstructed space in communication with said annular chamber; a plurality of ejection openings disposed in said outer wall distributed around the circumference thereof, each said opening having its axis in a radial direction, and a lining, said lining having a first bushing with its inner end projecting into said annular chamber; said first bushing constituting the sole defining path for exhausting slurry and made of a sintered wear resistant material with a conical outer surface, wherein the improvement comprises

a second bushing fitted over said first bushing, said second bushing having an outside diameter small enough to define a



clearance fit with said opening so that it will remain circular even if the opening is deformed when running, and a sealing ring around the outer circumference of the second bushing at a location adjacent the outer wall of said annular chamber to prevent escape of slurry into the clearance fit space between the second bushing and the opening into which it is inserted; said second bushing being provided with shoulder means on the outer surface thereof in its region radially outwardly of said sealing ring so as to be rotatable to positions throughout 360° to compensate for wear, said shoulder means engaging an inwardly extending edge of said opening and constituting the sole means preventing outward movement of said bushing from said opening but permitting free inward movement for easy removal or adjustment thereof.

Re. 30,964

PACKAGE INSPECTION AND HANDLING SYSTEM

Dean C. Butner, Clemmons, and Douglas C. Clark, Winston-Salem, both of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Original No. 3,939,984, dated Feb. 24, 1976, Ser. No. 534,939, Dec. 20, 1974. Application for reissue Feb. 28, 1980, Ser. No. 125,727

Int. Cl.³ B07C *5/02*

U.S. Cl. 209—536 **14 Claims**

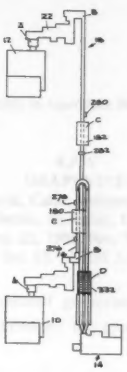
29. An accumulator for use on an interconnecting conveyor between a packaging machine and a cartoning machine comprising:

(a) a frame

(b) a magazine having a plurality of flights mounted for movement on said frame for receiving and storing packages from said conveyor, said conveyor passing through a part of said magazine;

(c) drive means for moving said magazine with respect to said conveyor;

(d) a flight status detecting means including a first and second sensing means adjacent to said conveyor, said first sensing means being located before the entrance end of said magazine and said second sensing means being located after the exit of said magazine, each sensing means detecting the presence of a package and said first sensing means detecting a full flight during the loading operation of said accumulator and the



second sensing means determining the absence of packages indicating an empty flight during the unloading operation of said accumulator;

(e) means for selectively activating and deactivating said flight status detecting means; and

(f) means for de-energizing said drive means at each flight of said magazine.

Re. 30,965

FERMENTATION OF OXYGENATED HYDROCARBON COMPOUNDS WITH THERMOPHILIC MICROORGANISMS AND MICROORGANISMS THEREFOR

Donald O. Hitzman, Bartlesville, Okla., assignor to Provesta Corporation, Bartlesville, Okla.

Original No. 3,981,774, dated Sep. 21, 1976, Ser. No. 618,191, Sep. 30, 1975. Application for reissue Aug. 31, 1978, Ser. No. 938,589

Int. Cl.³ C12P *21/00*

U.S. Cl. 435—68 **27 Claims**

1. A method of producing a single cell protein material which comprises culturing a Bacillus microorganism species NRRL B-8066 or NRRL B-8065 in an aqueous medium employing an oxygenated hydrocarbon as carbon and energy source under aerobic fermentation conditions and recovering the resulting microorganisms as a single cell protein material.

25. A biologically pure culture of bacteria having the identifying characteristics of Bacillus NRRL B-8065 or NRRL B-8066, said culture being capable of producing recoverable amounts of single cell protein upon aerobic fermentation in an aqueous nutrient medium containing assimilable amounts of carbon, nitrogen, and inorganic nutrients, wherein said carbon is substantially supplied in the form of an oxygenated hydrocarbon compound.

PLANT PATENTS

GRANTED JUNE 8, 1982

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,855

ROSE PLANT

Dorothy J. S. Bailey, Bakersfield, Calif., assignor to San Joaquin Rose Co., McFarland, Calif.

Filed Sep. 9, 1980, Ser. No. 185,537

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of rose plant of the grandiflora class, substantially as shown and described, characterized particularly by flowers of unusual multi-red toned coloration darkening upon aging to more uniform coloring.

4,856

GRAPEVINE

Harold P. Olmo, Davis, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Sep. 22, 1980, Ser. No. 189,538

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—47 **1 Claim**

1. The new and distinct grapevine herein described and illustrated, and identified by the characteristics enumerated above.

PLANT PATENTS

GRANTED JUNE 8, 1982

PATENTS

GRANTED JUN. 8, 1982

ERRATA

For CLASS	See PATENT NO.
114–344	4,333,191
464–026	4,333,319
374–010	4,333,332
116–217	4,333,339
376–100	4,333,796
376–210	4,333,797
376–449	4,333,798
523–220	4,333,863
525–501	4,333,864
523–410	4,333,865
524–534	4,333,866
524–547	4,333,867
524–152	4,333,868
524–100	4,333,869
548–421	4,333,877
548–531	4,333,878
549–549	4,333,879
427–089	4,333,922
525–390	4,334,050
564–367	4,334,085
373–159	4,334,119
372–057	4,334,199
372–090	4,334,200
364–167	4,334,266

PATENTS

GRANTED JUN. 8, 1982

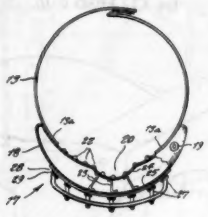
ERRATA

PATENTS

GRANTED JUNE 8, 1982

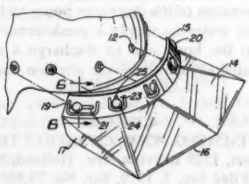
GENERAL AND MECHANICAL

4,333,179
PROTECTIVE GUARD FOR THE THROAT AREA
Robert A. Laurita, 105-00 Shore Front Pkwy., Apt. 6-L, Rockaway, N.Y. 11694
Filed Jun. 18, 1980, Ser. No. 160,834
Int. Cl.³ A41D *13/00;* A42B *3/02*
U.S. Cl. 2—2 **1 Claim**



1. A protective guard for a throat area, comprising in combination, a collar for being worn around a neck, and a shield at a front of said collar, said shield comprising an air bag on said collar, and a grill on a front side of said air bag; said grill being selectively detachable from said air bag by loop pile fastener means; said air bag being contoured to fit around an Adam's apple portion of said throat by means of a plurality of radiating straps between opposite inner and outer walls of said air bag so to maintain a contour for said Adam's apple.

4,333,180
HELMET VISOR
William P. Bay, Rte. 1, Box 53, Ormand Beach, Fla. 32974
Filed Dec. 11, 1980, Ser. No. 215,228
Int. Cl.³ A61F *9/04;* A42B *3/02*
U.S. Cl. 2—10 **9 Claims**



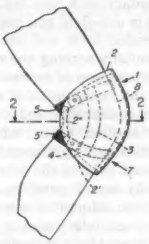
1. A visor for attachment to a helmet having snap portions thereon comprising in combination:

a visor support portion curved to fit adjacent said helmet;

a visor bill portion integral with said visor support portion and protruding therefrom;

said visor support portion having a plurality of generally U-shaped elongated apertures formed therein forming a plurality of resilient tabs, each tab formed by said U-shaped elongated apertures having a snap portion attached thereto resiliently mounting each said snap portion to said visor support portion when attached to a helmet, thereby giving said visor resilience relative to said helmet.

4,333,181
PROTECTIVE STRUCTURES FOR JOINTS
John Corriero, 310 Greenwich St.-Apt. 35J, New York, N.Y. 10013
Filed May 16, 1980, Ser. No. 150,597
Int. Cl.³ A41D *13/06*
U.S. Cl. 2—24 **12 Claims**



1. A protective structure for a joint of a body limb comprising:

a. a rigid shield;

b. bracing and cushioning means;

c. fasteners for attaching said bracing and cushioning means to said shield; and

d. means for attaching said shield, bracing and cushioning means and fasteners to the user

whereby

said rigid shield generally conforms in shape to the front and sides of said joint in semi-flexed configuration albeit larger; is continuous; and entirely surrounds the area to be protected; and

said bracing and cushioning means comprise body-conforming flexible straps which are in substantially intimate contact with the limbs surrounding the joint area and suspend said shield in non-contacting relationship to said joint.

4,333,182
BUTTON ANCHOR METHOD AND APPARATUS
Judith Seibt, P.O. Box 4304, Winter Park, Fla. 32793
Filed Sep. 8, 1981, Ser. No. 299,781
Int. Cl.³ A47C *23/02;* A44B *1/30, 1/18*
U.S. Cl. 2—265 **6 Claims**

1. A button anchor comprising:

an elongated elastic thread;

an elongated needle portion formed on one end of said elongated thread; and

an elongated ferrule portion attached on the other end of said elastic thread and having a bore in one end thereof, whereby said needle portion can thread said elastic thread through a garment and button and be locked into said ferrule portion.

4,333,183

DEODORIZING METHODS AND ARTICLES USING ION EXCHANGE MANUFACTURE

Karel Popper, 95 Paraiso Court, Danville, Calif. 94526

Division of Ser. No. 626,361, Oct. 28, 1975, Pat. No. 4,155,123, which is a division of Ser. No. 382,208, Aug. 24, 1973, Pat. No. 3,922,723. This application Nov. 9, 1978, Ser. No. 959,356

Int. Cl.³ A41B *9/00*

U.S. Cl. 2—400 **10 Claims**

1. A deodorant manufacture configured into a shaped article comprising anion exchange material and normally juxtaposed to a source of odorant of at least secondary status with said anion exchange in contact with said odorant, said anion exchange material being in non-fluid and essentially non-dispersible, substantially extended form and having anion exchange sites capable of substantially sorbing anions from said odorant at the pH existing in the region of contact between said material and said odorant; any components of said material that are endowed with anion exchange sites and are grossly discernible as distinct from one another being, when considered as a group, constrained against any significant flowing so that these components as a group exhibit the characteristic of being non-fluid and essentially non-dispersible; a primary source of odorant being one where odorant is inherent or is, in effect, being generated, and a secondary source of odorant being an odoriferous region of atmosphere immediately adjacent to, and disposed to flow into or out of, a confined space.

4,333,184

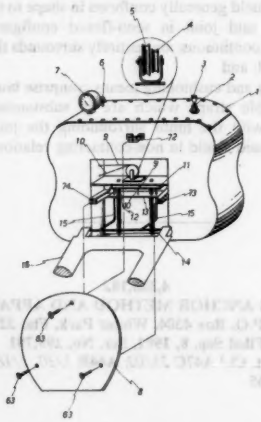
MULTI-FUNCTION CLOSET STOOL

Hsian Wang, No. 11, Alley 38, La. 80 Wen Lin N. Rd. Peitou, Taipei, Taiwan

Filed Mar. 21, 1980, Ser. No. 132,532

Int. Cl.³ E03D *1/00, 5/012, 5/04, 1/34*

U.S. Cl. 4—313 **6 Claims**



1. A closet stool comprising: a water tank having a water outlet valve; spring biased seat, biased upwardly having levers connected to a plurality of cables; first cable connected to and actuating a timing assembly connected to a pressure gauge of a piston sleeve containing air; a second cable connected to an end of said piston sleeve, said sleeve and piston compressing air communicating with an expandable air container, said piston resiliently swing biased in an upward position, said air container connected to a pivotal lever on one end and the other end comprising a lid for said water outlet valve which is actuated by said air container, wherein said seat is depressed by an occupant which moves said first cable to actuate said timing assembly, when said seat is released said first cable again actuates said timing assembly wherein after a set period of time said timing assembly releases the air in said sleeve to an air outlet connected to said air container, expanding said air container to move said lever to open said lid on said valve to release the water in the water tank which flushes the closet stool, wherein said pressure gauge measures the air pressure in the system.

4,333,185

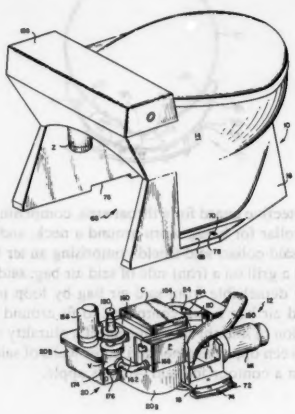
WATER SAVING TOILET SYSTEM

Walter O. Heinze, Swathmore, Pa., and Wesley M. Tufts, Holliston, Mass., assignors to International Water Saving Systems, Inc., New York, N.Y.

Filed May 7, 1980, Ser. No. 147,484

Int. Cl.³ E03D *9/10*

U.S. Cl. 4—319 **39 Claims**



1. A water saving toilet comprising a bowl, means for supplying flush water to the top of the bowl, a discharge port at the bottom of the bowl, an attrition chamber, conductor means connecting the port at the bottom of the bowl to the attrition chamber, said attrition chamber having a discharge port, means for effecting hydraulic attrition situated in the attrition chamber, a pump having an intake side connected to the attrition chamber to induct effluent from the bowl into the attrition chamber and a discharge side adapted to be connected to a waste pipe to remove the treated effluent from the attrition chamber, means for effecting operation of the means for effecting hydraulic attrition and the pump and control means for controlling operation of the discharge pump and the means for supplying flush water to supply a predetermined volume of flush water to the bowl and to discharge a corresponding volume of treated effluent from the attrition chamber.

4,333,186

SWIMMING POOL CONSTRUCTION

Jay A. Lankheet, 1329 Bayview Ave., Holland, Mich. 49423

Filed Sep. 7, 1979, Ser. No. 73,555

Int. Cl.³ E04H *3/16, 3/18*

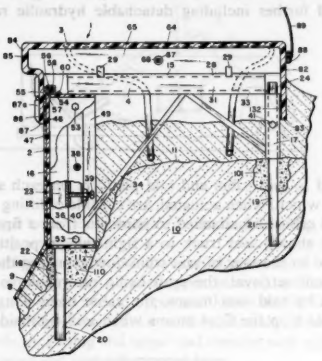
U.S. Cl. 4—506 **31 Claims**

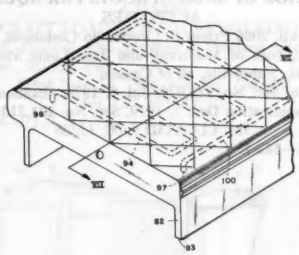
1. In a swimming pool construction including a plurality of prefabricated panels to form a deck assembly about a marginal portion of the pool, the improvement comprising:

means for interconnecting said deck panels, including:

a pair of flanges depending from the ends of each of said deck panel sections, and including a pair of aligned apertures disposed therethrough; said deck panel sections being positioned in an end-to-end relationship, and each of said flange apertures being aligned; first and second ones of said deck panel sections being disposed at opposite ends of said deck panel sections being disposed at opposite ends of said deck assembly; and

an elongate, rigid rod extending through each of said apertures and including means connecting one end of the rod with said first deck panel section, and tightening means on the other end of said rod, engaging the second deck panel section for moving the one rod end with respect thereto and tensing the rod, whereby each of said deck panel sections is drawn abuttingly together by





said rod to securely and detachably interconnect each of the deck panel sections in said deck assembly; and

a corner member for interconnecting non-linearly disposed straight sections of the deck assembly, having a pair of depending end flanges with an aperture aligned with said deck panel flange apertures therethrough for connection with one end of said rod.

4,333,187

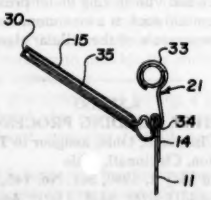
SHOWER CURTAIN

Bob A. Schuler, 2426 Wood Oak Ct., Irving, Tex. 75060

Filed Oct. 20, 1980, Ser. No. 198,914

Int. Cl.³ A47K *3/22*

U.S. Cl. 4—608 **7 Claims**



1. A shower curtain assembly for use across an opening into a shower enclosure between vertical walls adjacent to said enclosure and ceiling, said assembly comprising: two shower curtain panels positioned in adjacent coplanar overlapping relationship along vertical inside edge portions; securing means along vertical opposite end outside edge portions of said panels for securing each of said panels along said outside edge portion with an adjacent vertical wall surface; a horizontal securing strip secured and folded in overlapping relationship with the horizontal top edge portion of said curtain panels; a horizontal net panel secured along a bottom edge portion with said top edge portions of said curtain panels and said securing strip; and hanging and support means for supporting said curtain panels and said net panel from a horizontal rod across said opening into said shower enclosure and for supporting said net panel at an upward and inward angle from said curtain panels toward said ceiling.

4,333,188

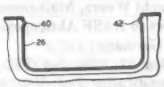
CONVERTIBLE SINK

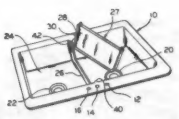
Harald W. Jensen, deceased, late of Oak Brook, Ill. (by Alice Jensen, executor), and Christen V. Jensen, Itasca, Ill., assignors to Stainless Steel Sinks, Inc., Addison, Ill.

Continuation-in-part of Ser. No. 80,261, Oct. 1, 1979, abandoned. This application Sep. 22, 1980, Ser. No. 186,471

Int. Cl.³ A47K *3/14*; E03C *1/186*

U.S. Cl. 4—514 **8 Claims**





1. A sink which can be divided into two or more watertight compartments, comprising: a liquid receptacle; at least one rib integrally formed within said receptacle extending along its internal surface; at least one plate spanning the distance between opposite sides of said receptacle; an elastic flange secured to the periphery of said plate along its edge; and a pair of detents located on opposite sides of said receptacle near the top of said rib to engage said flange and retain said flange against said rib, thereby causing a deformation of said flange and a mating of the flange and rib, which secures said plate within the receptacle.

4,333,189

AUTOMATIC BEE FEEDER

James R. Mentzer, Box 276, R.D. 2, New Holland, Pa. 17557, and Hugh J. Lofting, Box 230, R.D. 2, West Grove, Pa. 19390

Filed Oct. 16, 1980, Ser. No. 197,539

Int. Cl.³ A01K *53/00*

U.S. Cl. 6—5 **16 Claims**

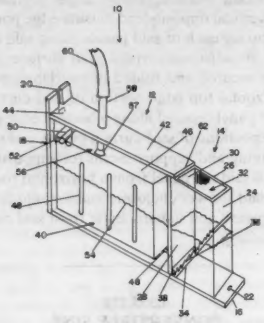
5. A float controlled feeding station for bees comprising:

a structure, attached to a replaceable hive frame and fitted within the outline of the frame, comprising:

a first chamber, enclosed to prevent access to its interior by bees, containing a float means acting upon a valve means which prevents liquid from flowing into the first chamber when the depth of liquid in the first chamber is greater than a specific level;

a second chamber with access means for bees, intercon-

nected with the first chamber at a point below the level of liquid at which the valve means prevents liquid flow; and



connecting means connecting the first chamber to a liquid supply means.

4,333,190

PROCESS FOR EXTRACTING WATER FROM DESIZING LIQUORS

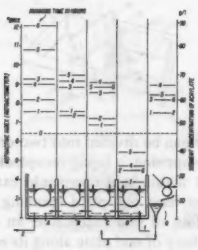
Wilhelm Ruettiger, Ludwigshafen; Franz Suetsch, Roedersheim-Gronau, and Albrecht Wuerz, Maikammer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, LuDwigshafen, Fed. Rep. of Germany

Filed Sep. 11, 1980, Ser. No. 186,388

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1979, 2937002

Int. Cl.³ D06B *3/10;* **D06L** *1/14*

U.S. Cl. 8—151 **10 Claims**



1. A process for desizing a fabric web comprising the steps of: first wetting the dry size-loaded fabric with the desizing liquor separated from a previous batch of fabric after desizing, so that the fabric, and the size adhering thereto, take up water from the desizing liquor by swelling, solvation or both, thereby increasing the concentration of size in the desizing liquor; separating the concentrated desizing liquor from the fabric; recycling the concentrated desizing liquor to a sizing operation; desizing the wetted fabric by a continuous fresh water wash; separating the desized fabric from the resulting desizing liquor; and recycling the desizing liquor to the first wetting step.

4,333,191

COMBINATION MOTOR HOME AND HOUSE BOAT

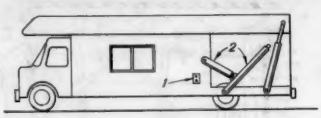
Alvin L. Long, Civilian Gen. Del., Beale A.F.B., Calif. 95903

Filed Jun. 22, 1978, Ser. No. 917,952

Int. Cl.³ B60P *3/10;* **B63B** *21/64;* **B63C** *13/001*

U.S. Cl. 114—344 **1 Claim**

1. The motor home-houseboat combination vehicle comprising a road-going vehicle having at least four wheels in standard configuration, an enclosed cab, the space behind said cab being occupied by a shelter of substantially the same transverse cross-sectional configuration as said cab and an inverted houseboat cabin having a cross section such that its sides and top are continuations of the like surfaces of said shelter, said houseboat cabin being positioned in tandem with and behind said shelter and lying atop a planar platform extension of the said shelter which extends to the end of the frame of said truck; and buoyant float means attached to the bottom of said inverted houseboat cabin, which extend substantially the length of the vehicle, and further including detachable hydraulic ram means



attached to said cabin and said platform on each side of the vehicle which, when actuated, are capable of lifting and rotating said cabin and attached to pontoons from a first inverted position aboard said truck to a right-side-up position in line with and to the rear of said truck for launching thereof, and subsequent retrieval, the craft being returnable to its initial position by said ram means, the cabin being longitudinally moveable atop the float means when said right-side-up position.

4,333,192

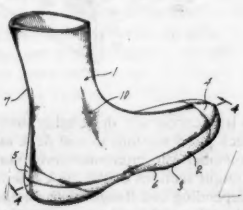
METHOD OF MAKING BOOTS FOR AQUATIC ACTIVITIES

André Stockli, 2086 Prieur St.; Fernando Castaneda, 7838 Casgrain St., both of Montreal, and Jean-Louis Stockli, 3112 Gérard St., Fabreville, all of Canada

Division of Ser. No. 922,070, Jul. 5, 1978, abandoned. This application Dec. 7, 1979, Ser. No. 101,213

Int. Cl.³ A43D *9/00, 13/08*

U.S. Cl. 12—142 E **8 Claims**



1. A method of making a boot for divers and the like, comprising the steps of forming a sock from a sheet of cellular elastomeric material, said sock including a sole portion and an upper, said elastomeric material covered at least on the outside of said sock by a fabric of synthetic yarn adhering to said elastomeric material over the entire surface of the latter, adhering an outsole assembly including an unvulcanized, non-cellular rubber composition, to said sole portion and to the adjacent part of the upper all around the sole portion, placing the resulting unit in an oven and vulcanizing under pressure said outsole assembly in situ on said sock at a maximum temperature below the degrading temperature of the cellular elastomeric material of the sock.

4,333,193

SHOE MOLDING PROCESS

Hans Bartneck, Cincinnati, Ohio, assignor to The United States Shoe Corporation, Cincinnati, Ohio

Filed May 1, 1980, Ser. No. 145,560

Int. Cl.³ A43D *9/00;* **A43C** *13/08;* **A43B** *9/10*

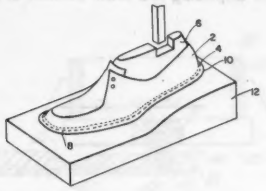
U.S. Cl. 12—142 RS **7 Claims**

1. A method of forming an integrally molded upper and shoe sole, comprising in sequence:

(a) stitching a full sole socklining to a shoe upper at a given distance from the lower peripheral edge of the upper, said distance defining a mold engaging lip of said upper;

(b) mounting said upper with stitched socklining on a shoe last to conform said full sole socklining and upper to said last;

(c) supporting the lasted upper and socklining in an upper mold;



(d) filling a lower mold with an expanding, foaming resin for forming a sole; and

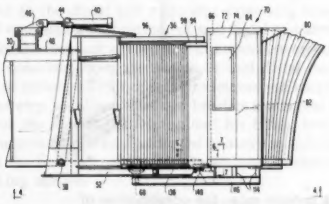
(e) mounting said upper mold over said lower mold with said mold engaging lip of said upper secured resiliently between the edges of said upper and lower molds for a time sufficient to cure said resin to the underside of said lasted full sole socklining and upper and contour said upper, said socklining and said sole to said last.

4,333,194

AIRCRAFT LOADER WITH REVOLVING CAB

Otto Drozd, Hialeah, Fla., assignor to Wollard Aircraft Equipment, Inc., Miami, Fla.

Filed Nov. 12, 1980, Ser. No. 206,283
Int. Cl.³ E01D 1/00
U.S. Cl. 14—71.5 **10 Claims**



1. In a conveyance vehicle loading ramp of the type providing an elongated enclosed passageway extending from a terminal building to an outer end portion adapted to be moved both horizontally and vertically to position the outer end in communication with a door in a conveyance vehicle spaced from the terminal building, the ramp including an elongated generally rectangular tunnel section, an articulated generally cylindrical head having a diameter greater than the transverse dimension of the tunnel mounted on the outer end of the rectangular tunnel section, and a vestibule mounted on the enlarged head for generally horizontal swinging movement therearound, the rectangular tunnel section, the articulated head and the vestibule having passages therethrough in communication with one another and cooperating to provide the enclosed passageway, the improvement comprising

a floor in the articulated head having a generally arcuate outer peripheral edge portion and a generally horizontal structural frame extending beneath and supporting the floor,

an arcuate track supported by the structural frame and extending adjacent to the peripheral edge portion of the floor of the articulated head, the arcuate track having an upwardly directed load bearing surface and having a common radial center with the generally arcuate peripheral edge portion of the floor of the articulated head,

a generally horizontal platform mounted on the generally horizontal structural frame for movement about the articulated head,

such platform including elongated, rigid arm means and a vestibule support portion projecting outwardly from the articulated head,

such rigid arm means extending beneath and substantially parallel to the structural frame of the articulated head,

pivot means pivotally connecting such elongated arms to the structural frame of the articulated head for limited movement about a generally vertical pivot axis containing the common radial centers of the arcuate portion of the floor of the enlarged head and of the arcuate track,

roller means mounted on the generally horizontal platform and projecting upwardly therefrom, the roller means engaging the upwardly directed load bearing surface of the arcuate track and cooperating with the pivot means to provide vertical support for such platform, the roller means including at least two rollers positioned one on each side of the passageway extending through the vestibule, and

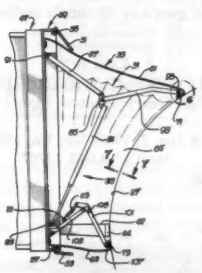
means mounting the vestibule on the vestibule support for limited horizontal swinging movement therwith around the generally vertical pivot axis containing the common radial centers of the arcuate edge portion of the floor of the articulated head and of the arcuate track whereby the vestibule is substantially entirely bottom supported.

4,333,195

FIRE PROTECTIVE WALKWAY APPARATUS

Robert D. Lichti, 3318 Warwood Rd., Lakewood, Calif. 90712

Filed Nov. 24, 1980, Ser. No. 209,709
Int. Cl.³ E01D 1/00
U.S. Cl. 14—71.5 **12 Claims**



12. A fire protective air terminal walkway apparatus for mating with the side of an aircraft around the entry door thereof and comprising:

a terminal walkway projecting from a terminal for mating on its free extremity with said aircraft around said entry door;

a shroud housing mounted on the said free extremity of said walkway;

a fire protective tubular shroud for surrounding the top, bottom and sides of said free extremity and collapsible into said housing, said shroud being extendable to cover said top, bottom and sides of said free extremity and conformable on its free end with such side of said aircraft around said entry door to seal therewith;

operator means carried by said shroud housing operable to selectively extend said tubular tunnel to cover said free extremity of said walkway and to carry said free end thereof into sealing engagement with said side of said aircraft;

and,

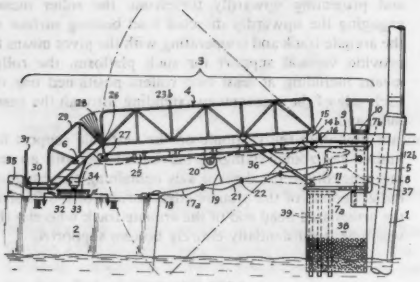
actuator means retaining said shroud in said housing and selectively operative upon detection of fire to actuate said operator for extension of said shroud to cover said free extremity of said walkway.

4,333,196

DEVICE AND METHOD OF TRANS-SHIPMENT BETWEEN A SHIP AND A FIXED STRUCTURE SITUATED AT SEA

Alain P. Bougaran, Marseilles, France, assignor to Compagnie Chambon, Marseilles, France

Filed Dec. 10, 1980, Ser. No. 214,630
Claims priority, application France, Dec. 12, 1979, 79 30808
Int. Cl.³ E01D *1/00*
U.S. Cl. 14—71.7 **12 Claims**



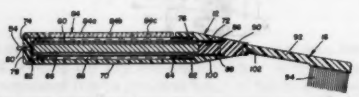
1. Device for trans-shipment of crews or light equipment between a ship and a fixed structure at sea, comprising a directional gangway, one end of which is mounted for pivoting on the fixed structure about a vertical axle, means for pivoting the said gangway about the said axle, and an air cushion designed to rest on a free area on the ship's deck for supporting the second end of the gangway by simple sliding support.

4,333,197

ULTRASONIC TOOTHBRUSH

Arthur Kuris, 3725 Henry Hudson Pkwy., New York, N.Y. 10463

Filed Jun. 2, 1980, Ser. No. 155,478
Int. Cl.³ A46B *13/02*
U.S. Cl. 15—22 R **14 Claims**



1. An apparatus for use in personal dental hygienic care comprising:

(a) an elongated hollow housing member having disposed therein;

(i) an elongated coil means extending within said housing member, and

(ii) magnetic biasing means disposed along the length of said coil means for providing lines of flux within said coil means;

(b) a brush member adapted to be received within the human mouth and moved across tooth and gingival surfaces including,

(i) an elongated portion of magnetostrictive core material extending from ore end of said brush member and removably receivable into the central portion of said coil means and cooperating therewith,

(ii) brush means having a plurality of bristles affixed therein disposed on the opposite end of said brush member

(iii) impedance transfer means operatively connected between said brush means and said core portion for transferring ultrasonic energy therebetween; and

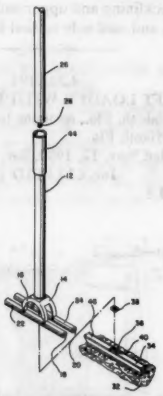
(c) ultrasonic energy driving means coupled to said coil means and adapted to be connected to a source of electrical energy for providing ultrasonic energy to said coil means for displacing said brush member at an ultrasonic rate.

4,333,198

SPONGE MOP

Joseph Vosbikian, 617 Ashmead St., Cheltenham, Pa. 19012

Filed Dec. 15, 1980, Ser. No. 216,156
Int. Cl.³ A47L *13/144*
U.S. Cl. 15—119 A **6 Claims**



1. In a sponge mop, the combination of

a hollow body of elongate tubular configuration;

an operating handle adapted for axial reciprocation within the body between a working position and a water wringing position,

the handle endwardly carrying a sponge assembly connector means, the sponge assembly connector means comprising a cylindrical, axially aligned fastener means downwardly projecting from the handle;

a sponge squeezing assembly affixed at one end of the hollow body,

the sponge squeezing assembly comprising at least a pair of spaced rollers to wring water from the sponge; and

a sponge assembly releasably connected to the sponge assembly connector means and comprising a sponge, a sponge carrier and engagement means to engage the sponge assembly fastener means,

the engagement means comprising a threaded nut secured to the sponge carrier, the nut releasably engaging the fastener means,

at least a major portion of the sponge being pulled between the rollers to drive water from the sponge when the operating handle is reciprocated to its said water wringing position.

4,333,199

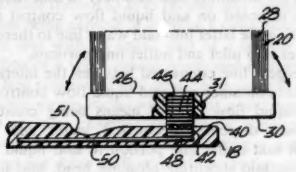
TOOTHBRUSH

Manuel Del Rosario, 6459 SW. 38 St., Miami, Fla. 33155

Continuation of Ser. No. 123,660, Feb. 22, 1980, abandoned, which is a continuation-in-part of Ser. No. 13,384, Feb. 21, 1979, abandoned. This application Apr. 30, 1981, Ser. No. 259,258

Int. Cl.³ A46B 7/06

U.S. Cl. 15—167 R 6 Claims



1. A toothbrush having an elongate handle with a proximal end zone and a distal end zone and including a brush mounted adjacent the distal end zone, said brush including a base of predetermined length and a first main surface and an array of bristles secured in upstanding relation to those and extending in a common direction for the first main surface, the brush base having a second main surface oppositely facing in relation to the first main surface and having a central recess extending toward the surface from which the brushes extend, said distal end zone of said handle having a first face with a recess in said first face confronting the second main surface of the brush base, a coil spring having an upper end and a lower end, said upper end being nested in the recess of said brush base and fixed therein to connect the brush to the handle and the lower end of said spring being nested in the recess of said distal end zone and being secured thereto; and said coil spring including a tangentially extending elongate portion said portion being embedded in the distal end zone and extending toward said proximal end, said upper surface of said distal end zone having a recess in the first face spaced in a direction toward the proximal end zone and from the recess in said distal end zone a distance of about one-half of said predetermined length of said base, whereby, said base with said brushes is adapted for rotation about the axis of said spring and for tilting and rocking motion, with said base being adapted to move in and out of said recess in the first face of the distal end zone of the handle in said rocking motion.

4,333,200

CHIMNEY CLEANER

Russel E. Thurow, 115 Tami La., Mankato, Minn. 56001

Filed Sep. 25, 1980, Ser. No. 190,726

Int. Cl.³ F23J 3/00

U.S. Cl. 15—243 9 Claims

1. A chimney cleaner device for use in cleaning inside surfaces of a chimney in both an upward and downward direction, the device comprising:

a pair of diverging cleaning arms, each cleaning arm having an integral upper shank portion and lower blade portion, the blade portion having an outermost scraping edge and a beveled surface slanting inwardly from the scraping edge to a lower end of the blade portion and the blade portion having most of the cleaning arm weight;

pivotal connecting means for pivotally connecting the cleaning arms at an upper end of the shank portion; and

biasing means for providing a lateral outward force to bias the blade portions of the cleaning arms outwardly about the pivotal connecting means in a diverging manner sufficient to bring the scraping edge into engagement with the inside surfaces of the chimney as the device is raised and lowered in the chimney with the weight of the combined cleaning arms overcoming the lateral force of the biasing means sufficiently to permit gravitational downward movement of the cleaner device.

4,333,201

DEVICE FOR PREVENTING THE DISCHARGE OF DUST AND FIBER PARTICLES FROM THE WORK ZONES OF A TEXTILE MACHINE

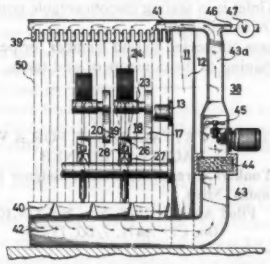
Joachim Rohner, Mönchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Mönchen-Gladbach, Fed. Rep. of Germany

Filed Nov. 19, 1979, Ser. No. 95,312

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1979, 2903139

Int. Cl.³ A47L 5/38

U.S. Cl. 15—301 11 Claims



1. Device for carrying out a method of preventing the discharge of dust and fiber particles from textile machine work zones having running threads disposed therein, comprising a machine frame, air supply and exhaust ducting connected to said machine frame, air discharge and air suction nozzles disposed on said ducting generating a closed air screen system separating the work zones from the ambient air in the vicinity of the machine, and additional means being connected to said ducting and being disposed within said air screen system for venting air from the work zones.

4,333,202

FLOOR SCRUBBER WITH COMBINED SOLUTION AND RECOVERY TANK

Thomas S. Block, Muskegon, Mich., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Dec. 28, 1979, Ser. No. 108,295

Int. Cl.³ A47L 11/20

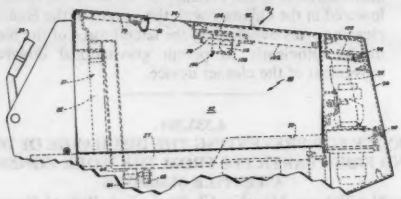
U.S. Cl. 15—320 16 Claims

1. In a unitary floor scrubbing apparatus of the type including a scrubber means for scrubbing a floor surface, vacuum means for recovering the dirty solution from the floor surface and an improved removable cleaning solution and recovery storage means for containing the cleaning solution and the recovered cleaning solution, wherein said improved cleaning solution and recovery storage means comprises:

a rigid member having spaced inner and outer walls, said

inner wall including an inner bottom and four inner side walls, said outer wall including an outer bottom and four outer side walls, said inner and outer wall defining a pair of tanks, one of said tanks being a cleaning solution storage tank and the other of said tanks being a recovery tank, said recovery tank having at least one orifice for receiving the dirty solution and said cleaning solution storage tank having orifices for receiving and discharging cleaning solution to be applied to the floor surface;

a top affixed to said recovery tank permanently and substan-



tially closing said recovery tank and containing an aperture opening into said recovery tank;

connecting means between said vacuum means and the aperture in said top of said recovery tank for applying a vacuum to said recovery tank, said connecting means having a substantially rigid movable portion terminating in an inlet of said connecting means to said vacuum means, which inlet is in sealing disconnectable connection to the aperture in said top;

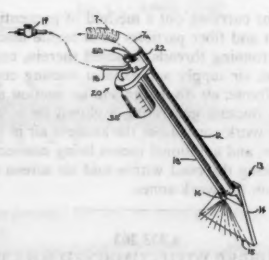
drain means connected to said member for permitting selective draining of the contents of said tanks.

4,333,203

CONVERSION ATTACHMENT FOR A WET-DRY VACUUM CLEANER

Robert A. Yonkers, Grandville, Mich., assignor to Bissell, Inc., Grand Rapids, Mich.

Filed Apr. 23, 1980, Ser. No. 139,106
Int. Cl.[3] A47L *7/00, 11/34*
U.S. Cl. 15—321 **18 Claims**



1. For use with a source of water under pressure and a wet-dry vacuum cleaner having a recovery tank with an inlet and an outlet and means for selectively vacuumizing said tank, said cleaner further having a vacuum conduit connected to said inlet and a wand connected to said conduit, said wand having a cleaning head at its lower end with said head including a vacuum nozzle connected through said wand and conduit to said inlet; a conversion attachment for said vacuum cleaner and comprising:

(a) a substitute wand connectable to said vacuum conduit to form a suction line therewith and with said wand having a substitute cleaning head with a vacuum nozzle,

(b) liquid discharge means mounted on said substitute cleaning head,

(c) a water line connected to said liquid discharge means and adapted for connection with said source of water,

(d) an assembly inserted in said water line, said assembly including a detergent container and also including liquid flow control means for dispensing detergent into said water line when water is flowing therethrough from the water source,

(e) means for mounting said assembly to said suction line,

(f) means disposed on said liquid flow control means for connecting the latter into said water line to thereby divide the latter into inlet and outlet line portions,

(g) a detergent line connected between the interior of said detergent container and said liquid flow control means,

(h) said liquid flow control means being constructed to selectively dispense pressurized water and detergent through said outlet line portion to said liquid discharge means on said substitute cleaning head, said liquid flow control means comprising:

(1) a member forming a valve body having:

(A) a water inlet port connectable to said inlet line portion,

(B) a detergent inlet port connected to said detergent line,

(C) and a liquid outlet port connectable to said outlet line portion,

(2) said ports being positioned so that said detergent inlet port is disposed between said water inlet port and said liquid outlet port,

(3) a tubular valve member shorter than and slideably disposed in said valve body, said valve member having an inlet opening in its wall which is selectively registrable with said water inlet port, and having an inner head end having a discharge passageway disposed therein which faces said liquid outlet port,

(4) said valve member being movable longitudinally in said valve body between:

(A) a retracted position wherein said inlet opening registers with said water inlet port and said head end terminates longitudinally outwardly of said liquid outlet port to form a metering chamber communicating with said detergent inlet port, said discharge passageway and said liquid outlet port,

(B) and an extended position wherein the valve member wall blocks said water and detergent inlet ports and said metering chamber is replaced by the said head end of the valve member,

(5) and means to move said valve member between said retracted and extended positions to thereby control the flow of liquid from said outlet port to said liquid discharge means of said substitute cleaning head,

(i) the construction being such that, upon actuation of said liquid flow control means of said assembly and said tank vacuumizing means of said cleaner, a mixture of water and detergent liquid is discharged through said liquid discharge means onto the surface to be cleaned and subsequently removed to the said recovery tank of said cleaner.

4,333,204

ROTARY FLOORING SURFACE TREATING DEVICE

Clifford L. Monson, 1765 Ala Moana Blvd., #492, Honolulu, Hi. 96815

Continuation-in-part of Ser. No. 89,486, Oct. 30, 1979, Pat. No. 4,264,999. This application Jul. 7, 1980, Ser. No. 166,396
Int. Cl.[3] A47L *11/34*
U.S. Cl. 15—321 **8 Claims**

1. A rotary flooring surface treating device which is movable on and over the surface to be treated, said device comprising a lower carriage unit and an upper handle unit,

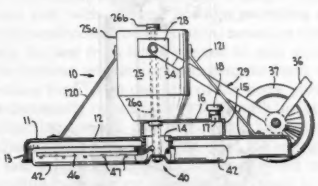
said lower carriage unit including a shroud means, a drive means and a wand means;

said shroud means including a generally disc-shaped cover

part having a skirt extending downwardly from the periphery thereof and an opening therethrough at the center thereof, said shroud means also including means forming a vacuum chamber positioned on the upperside of said cover part so as to enclose said opening, said vacuum chamber including means forming a port for sealing attachment thereto of one end of a flexible hose which is connected at its other end to a vacuum generating means, said shroud means also including an annular vacuum seal means extending downwardly from the underside thereof so as to enclose said opening, said seal means being capable of forming a substantially vacuum-tight seal with an upper part of a hollow cylindrical portion of a wand means positioned therein, yet allow for free rotation of said upper part therein;

said drive means including a motor positioned on top of said vacuum chamber and fixedly connected to said shroud means, said motor including a rotatable hollowed out drive shaft sealingly extending downwardly through said vacuum chamber and through said opening in said cover part, the upper end of said hollowed out drive shaft extending upwardly through the motor housing and terminating in a liquid-tight coupling means, the lower end of said hollowed out drive shaft including multiple openings therein,

said wand means, which is fixedly attached to said drive shaft of said motor, including a hollow cylindrical portion whose upper part is generally sealingly yet rotationally mounted within said annular vacuum seal means and multiple radially-extending arms, said arms each including a radially-extending vacuum duct means with a bottom vacuum slot, each of said vacuum duct means being operatively connected to the lower part of said hollow cylindrical portion, and a discharge pipe with spray nozzles attached to the side of each vacuum duct means;



multiple hose means sealingly connected to separately extend between one opening in the lower end of said hollowed out drive shaft and a separate discharge pipe, each of said hose means acting to deliver a portion of the treating solution which has passed downwardly through the hollowed out drive shaft from the liquid-tight coupling means to a separate discharge pipe;

said lower carriage unit also including wheel means for movably mounting said shroud means and said wand means above the flooring surface to be treated and a bracket means for connecting said lower carriage unit to said upper handle unit;

said upper handle unit including an extension means and a handle means,

said extension means including at least one elongated extension member, one end of which is adjustably connected to said bracket means,

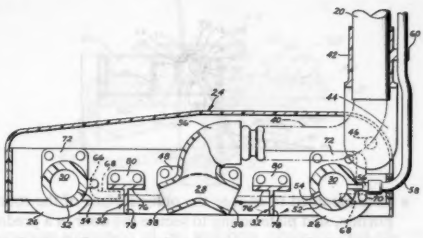
said handle means comprising an operator gripper means connected to said extension means adjacent the second end thereof.

4,333,205

VACUUM CLEANER WITH SOIL AGITATOR AND COMPRESSED AIR MEANS

James C. Woodward, Elizabethtown, and Marion D. Holland, Cox's Creek, both of Ky., assignors to Robert E. Robbins, Elizabethtown, Ky.

Filed Nov. 14, 1979, Ser. No. 94,354
Int. Cl.³ A47L 5/14
U.S. Cl. 15—345 **6 Claims**



3. Vacuum cleaning apparatus including a first source of vacuum air pressure and a second source of compressed air, said apparatus comprising:

a. a vacuum hood enclosure supported on and movable along a surface to be cleaned and having an open side confronting the said surface to be cleaned to form therewith a traveling vacuum chamber;

b. a suction nozzle inlet opening located within the vacuum hood enclosure and having an outlet opening that is connected to the vacuum air pressure source;

c. a jet stream manifold also located within the vacuum hood enclosure and having an inlet opening that is connected to the compressed air source;

d. a power-driven brush also located within the hood enclosure and within the said open side thereof and being interposed generally between the jet stream manifold and the suction nozzle inlet opening;

e. the said jet stream manifold being in the form of a shroud which overlies the brush, at least one lower edge of the shroud being provided with carpet rake formations, the walls of the shroud having hollow passages for the movement of compressed air therethrough, the lower tips of the rake formation being provided with orifices that are directed toward the working area of the brush, whereby the jet stream manifold is a combined carpet rake and source and carrier of a plurality of jet streams.

4,333,206

NESTED HINGE MEMBERS WITH SPRING ARM CATCH

Richard D. Lang, Chittenango, and Theodore S. Bolton, Liverpool both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

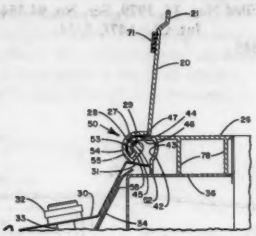
Filed May 19, 1980, Ser. No. 151,038
Int. Cl.³ E05D 1/04
U.S. Cl. 16—335 **4 Claims**

1. A rotatable door mechanism for securing a door of an air conditioning unit which comprises:

a support assembly having a curvilinear rotating support defining both an inner guide surface and an outer guide surface and a slide support spaced from the rotating support, said slide support including a curvilinear slide surface;

a pivot assembly for mating with the support assembly including a rotating portion having an inner guide surface for engaging the outer guide surface of the rotating support and an outer guide surface for engaging the slide surface of the slide support and a pivot cylinder for engaging the inner guide surface of the rotating support;

a door mounted to the pivot assembly whereby the door may be rotated between positions with the various surfaces of the pivot assembly and support assembly engaging each other to provide for rotational movement therebetween; and



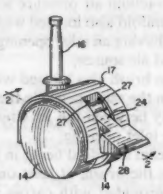
a plate mounted to engage the outer surface of the rotating portion, said plate acting to secure the door in a predetermined position by applying a force to the rotating portion of the pivot assembly.

4,333,207

TWIN WHEEL CASTER BRAKE

John T. Atwood, South Bend, Ind., assignor to Shepherd Products U.S. Inc., St. Joseph, Mich.

Filed Dec. 22, 1980, Ser. No. 219,363
Int. Cl.³ B06B *33/00*
U.S. Cl. 16—35 R **6 Claims**



1. A twin wheel caster brake arrangement including a caster having a pair of wheels mounted on a common axle at opposite sides of a central body, said body having a central hub and a wheel cover overlying said wheels, a brake lever between the wheels pivotally mounted under the wheel cover and an outer end of the lever extending through the wheel cover, and a brake pin at the inner end of the lever extending into locking engagement with the respective wheels when said outer end is fulcrumed about said pivotal mounting.

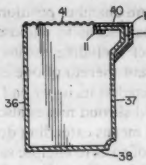
4,333,208

GUTTER GUARD CLIP AND METHOD OF MANUFACTURE

Ernest H. Fuller, 3225 E. Riverside Dr., Ft. Myers, Fla. 33901

Filed Jul. 9, 1979, Ser. No. 55,595
Int. Cl.³ A44B *21/00*; B23P *11/00*
U.S. Cl. 24—1 **7 Claims**

1. A clip useful for securing a guard to a gutter comprising at least one tab of from about ⅛ to about ¼ inch in width and from about ¼ to about 1 inch in length adjacent one end, said tab being of sufficient length to be capable of being positioned below an opening of a gutter screen and bent under the lip of the gutter flange means adjacent said tab for supporting a portion of the clip on the surface of said guard, and a body member capable of being bent around the outside of said flange, the said clip being constructed of a malleable material which can be bent readily beyond its elastic limit without fracturing, said material having a thickness of from about 0.025



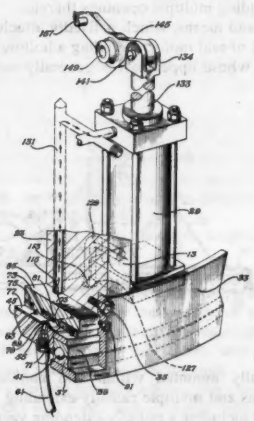
to about 0.25 inch and said clip having an overall length of from about 2 to about 4 inches.

4,333,209

ROTARY POWER SLIPS

Neil W. Herst, Houston, Tex., assignor to BJ-Hughes Inc., Houston, Tex.

Filed Jul. 3, 1980, Ser. No. 165,585
Int. Cl.³ E21C *1/00*
U.S. Cl. 24—263 DA **4 Claims**



1. Improved rotary power slips having a housing for mounting concentrically with the pipe opening in a rotary table of an earth drilling rig, comprising:

an annular stationary seal ring supported by the housing with a transverse upper surface and an annular opening generally coaxial with the pipe opening in the rotary table, said stationary seal ring having a primary fluid conduit for connection to a stationary fluid source on the drilling rig;

an annular air transfer plate secured to the housing with a transverse lower surface adjacent the stationary seal ring;

expansive means mounted on the upper surface of said stationary seal ring and cooperative with the lower transverse surface of said air transfer plate for forming at least one annular expansive fluid duct therewith when pressure is applied to said primary fluid conduit in said stationary seal ring;

said housing having a secondary fluid conduit in fluid communication with said annular fluid duct;

fluid actuated operator means connected to said slips and carried by said housing in fluid connection with said secondary fluid conduit to selectively grip and release pipe in the rotary table in response to fluid flow through the primary conduit, the annular expansive fluid duct, the air transfer plate, and the secondary fluid conduit.

4,333,210

SEALING DEVICE

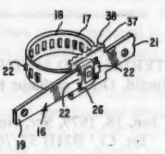
Ralph G. Burnett, Kenosha, Wis., assignor to American Casting and Manufacturing Corporation, Plain View, N.Y.

Filed May 15, 1980, Ser. No. 150,242

The portion of the term of this patent subsequent to Sep. 23, 1997, has been disclaimed.

Int. Cl.³ B65D *27/30, 77/10*

U.S. Cl. 24—30.5 R **3 Claims**



1. A sealing device for a receptacle having at least one open end, which receptacle consists at least in part of deformable material adjacent the open end thereof, so that the material may be gathered together to form a neck, said sealing device comprising a relatively thin band of flexible material which is of sufficient strength that it is manually severable only by cutting through the same, said band comprising an elongated flat body portion and a pair of end portions at the extremities thereof, means for tightly securing the body portion of said band circumferentially about the neck of said receptacle adjacent to said end, with said end portions extending outwardly from the circumferential body portion, means on said band for preventing the seal from being opened to gain access to said receptacle without severing or damaging the band, a plurality of projections formed on one side of the body portion of the band at substantially right angles to the length thereof and bent in one direction toward one end of the band, and locking means adjacent said one end of the band for engaging one or more of said projections, said locking means and said projections permitting relative movement of said band in one direction relative to said locking means and substantially preventing relative movement thereof in the other direction, said locking means comprising a first substantially rectangular panel formed in the band and extending outwardly from one side of the band, a transverse slit for receiving one free end of the band when the device is assembled, a second substantially rectangular panel formed in the band and extending outwardly from the band in the opposite direction to the first panel, a window formed centrally of the first panel provided with a pair of transversely extending edges, a reversely bent tooth formed on one of the said window edges, a pair of transversely extending slits formed at the edges of said panel, certain of said individual teeth on the band engaging with one transverse edge of said panel, one of said teeth engaging with the reversely bent tooth on said one transverse edge of said window and one transverse edge of said depression when the device is assembled.

4,333,211

SLIP-ON RECEPTACLE

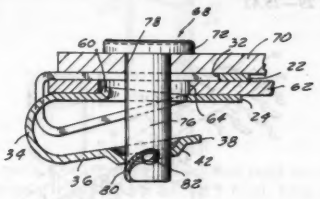
Conrad J. Gunther, Uniondale, N.Y., assignor to Dzus Fastener Co., Inc., West Islip, N.Y.

Filed Mar. 13, 1980, Ser. No. 130,020

Int. Cl.³ F16B *37/04*

U.S. Cl. 24—221 R **9 Claims**

1. A slip-on receptacle adapted to be inserted on one of two members to be fastened in alignment with a hole therein and to receive and engage with a stud coupled with the other of the two members so as to fasten the two members together comprising; a resilient strip folded upon itself with one section of the strip engaging the undersurface of the one member and another upper section of the strip engaging the upper surface of the one member, a central portion of the strip severed along both side edges and across one end thereof which is folded upwardly and back upon itself above the upper section to form a cantilever spring, stud engaging means on the cantilever spring in alignment with the hole in the one member to receive the stud coupled with the other member and passed through the hole and to interengage with the stud and hold the members together, the two sections being in close fitting position on the one member in order to reinforce the fastening action and



discourage separation of the members when the stud and receptacle are coupled, the upper section of the strip having a pair of parallel edge portions formed between an edge of the strip and an adjacent edge of the central portion, and each edge portion of the upper section being bent upward away from the one member and spaced a lesser distance from the one member than the cantilever spring.

4,333,212

SNAP-HOOK, PARTICULARLY FOR MOUNTAINEERING

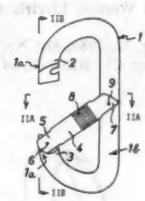
Jean-Claude Bibollet, F-Glapigny-74230-Thones, France

Filed Nov. 16, 1979, Ser. No. 94,858

Claims priority, application France, Nov. 17, 1978, 78 33354

Int. Cl.³ A44B *13/02*

U.S. Cl. 24—233 **1 Claim**



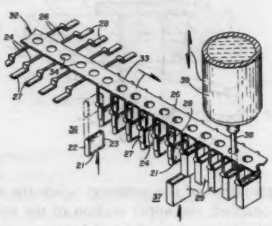
1. A snap-hook for use with ropes or the like comprising an open ring made from a cylindrical rod and a tilting finger, said open ring comprising a main longitudinal back arm and two curved end portions, said tilting finger being pivotably attached at one end of said open ring so as to pivot thereon and join the other end of the ring so as to shut the snap-hook, the axis around which the finger pivots being inclined with respect to the line perpendicular to the plane of the ring by only a few degrees, so that when the snap-hook opens, the free end of the finger tilts out of this plane and passes along side of and very close to the main longitudinal back arm of the ring, almost touching it when in fully opened position, thereby increasing the opening of the snap-hook and facilitating insertion therein of ropes or the like, and spring means for returning the finger to the plane of the ring and shutting the snap-hook.

4,333,213

APPARATUS FOR BONDING LEADS TO CAPACITOR BLANKS

John R. Meal, Naperville, and Donald K. Sandmore, Oak Lawn, both of Ill., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 72,394, Sep. 4, 1979, Pat. No. 4,268,942.
This application Jan. 16, 1981, Ser. No. 225,579
Int. Cl.³ H01G 4/32
U.S. Cl. 29—25.42 7 Claims



1. An apparatus for assembling leads to a capacitor blank wherein the capacitor blank is constructed of a rolled metallized film having a pair of end electrodes constructed of heat fusible material, which comprises:

an anvil;

means for cyclically advancing a lead frame having a central strip and oppositely extending leads over said anvil;

means rendered effective upon each advance of the lead frame for advancing a capacitor blank into proximity to the underside of the anvil;

means rendered effective upon each advance of a capacitor blank into proximity of the anvil for bending a pair of leads about said anvil and into engagement with the pair of end electrodes; and

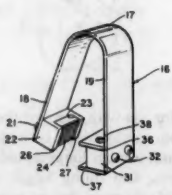
heat means rendered effective following bending of said pair of leads for fusing the leads to the end electrodes.

4,333,214

WIRE WELDMENT DEFLASHING TOOL

Harry C. Neumann, Alsip, and Frank G. Skiba, Villa Park, both of Ill., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 31, 1980, Ser. No. 135,599
Int. Cl.³ B23D 71/04
U.S. Cl. 29—80 2 Claims



1. A tool for removing a bulbous portion from a wire, which comprises:

a generally U-shaped resilient band having a pair of opposed end sections with facing inside surfaces;

a first block secured to the inside facing surface of a first end section of said resilient band, a second block secured to the inside facing surface of the second end section of said resilient band and positioned to engage said first block when said band is compressively flexed;

said first and second blocks each provided with a recess of predetermined depth;

a first abrading member mounted in a first of said recesses and a second abrading member mounted in the other of said recesses, said abrading members each having a thickness which is slightly less than said predetermined depth of said recess in which the abrading member is mounted; and

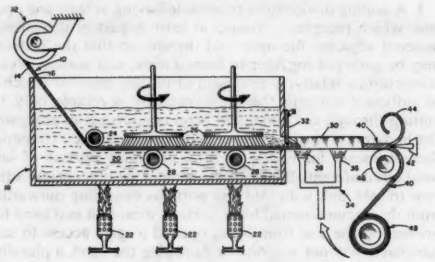
a pair of guide plates secured to one of said blocks for guiding the blocks into juxtaposition upon flexing of said band to move the blocks toward each other.

4,333,215

BEARING MATERIAL AND METHOD OF MAKING

Lee A. Swanger, Euclid, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jun. 18, 1979, Ser. No. 49,102
Int. Cl.³ B21D 53/10
U.S. Cl. 29—149.5 S 11 Claims



1. A method for producing a multilayer metallic bearing material which has an interlayer of aluminum or aluminum-base alloy comprising:

providing a composite strip of a backing material bonded to said aluminum or aluminum-base alloy;

passing the composite strip below the surface of a bath of a molten bearing overlay material;

removing surface oxide from the surface of the aluminum or aluminum-base alloy layer while under the surface of the bath thereby allowing uniform adherence of the molten overlay material to the aluminum or aluminum-base alloy interlayer; and

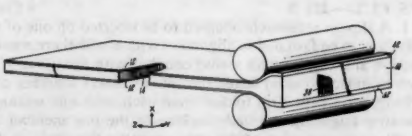
withdrawing the composite strip from the bath and simultaneously controlling uniform thickness of the overlay material on the interlayer over the width of the strip thereby providing the bearing material with bonded overlay layer of the ultimate bearing surface material upon solidification without the need of further casting step.

4,333,216

METHOD FOR MANUFACTURING A SANDWICH PANEL STRUCTURE

Edward R. Slaughter, Palm Beach Shores, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 23, 1981, Ser. No. 246,757
Int. Cl.³ B23P 17/00
U.S. Cl. 29—157 R 1 Claim



1. A method for manufacturing a sandwich panel consisting

of a pair of opposing sheets separated by a multiplicity of pins, wherein the method comprises:

assembling alternating strips of material from which the pins are to be fabricated and a leachable matrix material;

encasing the assemblage of alternating strips in a sheath of matrix material;

rolling the encased assemblage in the longitudinal direction of the alternating strips to bond the strips into a composite sheet containing parallel bars of pin material;

stacking a plurality of composite sheets one upon the other with the bars of pin material in parallel alignment;

rolling the stacked composite sheets in the longitudinal direction of the bars of pin material to bond the sheets in a composite billet containing multiple rows of ribbons of pin material;

cutting a material slice from the composite billet in a direction perpendicular to longitudinal direction of the ribbons of pin material to form a slice of said composite billet in which a multiplicity of pin material ribbons extend across the slice;

placing a facing sheet of material from which the sandwich panel is to be constructed on each side of the composite slice in contact with opposite ends of the pin material extending across the slice;

rolling the facing sheets and composite slice to bond the sheets and pin material embedded in the slice one to another and to form pins of the desired end shape and dimension; and

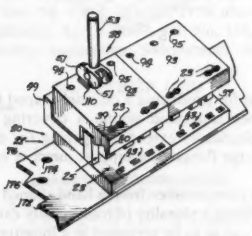
leaching the matrix material from between the pins to form a sandwich panel in which the pair of opposing face sheets are separated by a multiplicity of spaced pins.

4,333,217

APPARATUS FOR STAPLING BELT

Winston C. Pray, Lombard, Ill., assignor to Flexible Steel Lacing Company, Downers Grove, Ill.

Filed Sep. 1, 1978, Ser. No. 938,893
Int. Cl.³ B23P *11/00*
U.S. Cl. 29—243.51 **15 Claims**



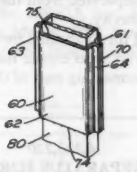
1. In an apparatus having a staple guide block means having staple guiding means therein for guiding the staples into openings in an upper belt fastener plate of a belt fastener being held and located by said guide block means relative to the staple guiding means and having an anvil means for deflecting the ends of the staples driven through a belt disposed between said guide block and said anvil means and through openings in a lower belt fastener plate with the staple legs being received within grooves in said anvil means, the improvement comprising: belt fastener locating means on said guide block means being movable in a lateral direction relative to said anvil means and said staple guiding means between a first position to engage and position a rearward end of first length of belt fastener and a second position to engage and position a rearward end of a second length of belt fastener, and means for securing said belt fastener locating means in said first and second positions.

4,333,218

METHOD OF REPAIRING A BOX BEAM

Alan W. Wentworth, 41 Mayfair Rd., Warwick, R.I. 02888

Filed May 30, 1980, Ser. No. 154,811
Int. Cl.³ B22D *19/10*; B23K *31/00*
U.S. Cl. 29—402.16 **5 Claims**



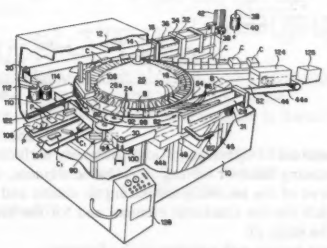
1. The method of repairing a weakened rigid box beam of external angular cross section having a front, back and side walls, comprising the steps of forming a plate to snugly externally fit said front wall and a portion of each adjoining side wall of said beam, forming a second plate to externally snugly fit said back wall and a portion of each adjacent side wall, said front and back side wall edge portions respectively in close adjacency, clamping both plates in position and welding all edges of said plates to each other and to the box beam to secure said plates together in position embracing and strengthening said box beam.

4,333,219

METHOD AND MACHINE FOR RECOVERING MATERIAL FROM CONSUMED ACCUMULATOR BATTERIES

Marco Ginatta, Turin, Italy, assignor to Snamprogetti S.p.A., Milan and Elettrochimica Marco Ginatta S.p.A., Santena, both of, Italy

Filed Oct. 3, 1980, Ser. No. 193,457
Claims priority, application Italy, Oct. 16, 1979, 69007 A/79
Int. Cl.³ B23Q *17/00*; B23P *19/00*
U.S. Cl. 29—403.3 **25 Claims**



1. A method for recovering material from consumed accumulator batteries with a parallelepiped casing, comprising the following stages:

providing a horizontal rotatable table (**16**),

keeping said table (**16**) under continuous rotation,

continuously feeding a row of batteries (B) tangentially to the periphery of the rotatable table (**16**) in such a manner as to bring one of the side walls (C_3) of the casing (C) of each battery (B) into contact with the periphery of the table (**16**), such that a portion of said side wall (C_3) projects below the contour of the table (**16**),

exerting a radial thrust on that side wall (C_2) of the casing (C) of each battery (B) which is opposite the wall (C_3) in contact with the periphery of the table (**16**) such as to keep said battery (B) adhering to said table (**16**) over a path

corresponding to a substantial angle of rotation of the table (16),

separating the lower horizontal wall (C_1) of the respective casing (C) from each battery (B) by a cutting action carried out on that part of each battery (B) which projects below the contour of the rotatable table (16) while said battery (B) is adhering to the table (16), so as to enable said wall (C_1) to be separated from the remaining part of the battery (B) by gravity,

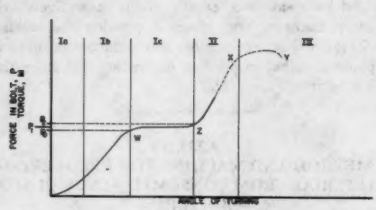
releasing the radial thrust exerted on each battery (B) at the end of said path so as to enable the table (16) to be separated from said remaining part of the battery (B) by gravity.

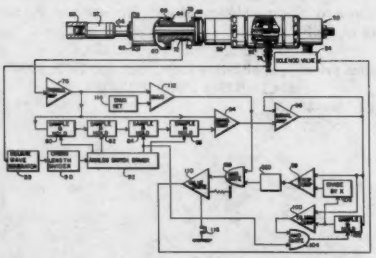
4,333,220

METHOD AND APPARATUS FOR TIGHTENING AN ASSEMBLY INCLUDING A PRE-LOAD INDICATING FASTENER

Arthur J. Aspers, Williamstown, N.J., assignor to SPS Technologies, Inc., Jenkintown, Pa.

Filed Jan. 18, 1980, Ser. No. 113,416
Int. Cl.[3] B23Q *17/00*; B23P *19/04*
U.S. Cl. 29—407 17 Claims





1. A method of tightening a joint assembly including a pre-load indicating fastener having a crushable element, the tightening curve of the assembly exhibiting an elastic and a plastic region each for the crushable element and for the joint, comprising the steps of:

applying torque and rotation to the fastener;

developing a changing signal representative of the torque gradient of the torque imparted to the fastener with respect to the rotation thereof;

determining the largest torque gradient developed up to any point and storing an information signal representative thereof;

comparing said stored information signal and said gradient signal and developing a control signal indicative of the commencement of plastic deformation of the crushable element when said gradient signal has changed to a predetermined percentage of said information signal;

continuing to apply torque and rotation after said control signal indicates commencement of said plastic deformation of the crushable element; continuing to compare said stored information signal and said gradient signal and continuing to develop said control signal until said control signal indicates the commencement of elastic deformation of the joint; and

ceasing to apply torque and rotation when said control signal indicates the commencement of elastic deformation of the joint, whereby the crushable element is fully plastically deformed.

6. Apparatus for tightening a joint assembly including a pre-load indicating fastener having a crushable element, the torque-rotation curve of the assembly exhibiting an elastic and a plastic region each for the crushable element and for the joint, which comprises:

first means for imparting torque and rotation to the fastener;

second means connected to said first means for detecting significant changes in the slope of the torque-rotation curve of the assembly and generating a control signal indicative thereof;

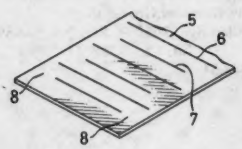
third means responsive to said control signal for ignoring said control signal when said control signal indicates the commencement of plastic deformation of the crushable element and for responding to said control signal when said control signal indicates commencement of elastic deformation of the joint assembly, whereby the crushable element is fully plastically deformed and fourth means responsive to said third means for causing said first means to cease to import said torque and rotation to the fastener.

4,333,221

METHOD FOR PRODUCING A CHANNEL SHAPED TRIM

Keizo Hayashi, Nagoya, Japan, assignor to Toyoda Gosei Co., Ltd., Nagoya, Japan

Filed Apr. 28, 1980, Ser. No. 144,453
Claims priority, application Japan, May 31, 1979, 54/67868
Int. Cl.[3] B32B *31/16*
U.S. Cl. 29—413 5 Claims



1. A method for producing a channel-shaped trim including a core member embedded within a covering material and having a longitudinally extending opening for embracing and clamping an edge flange of a support member comprising the steps of:

preparing a core member from a band-shaped metallic plate by perforating a plurality of transversely extending slits in said plate, so as to be arranged in a longitudinal direction thereof at predetermined intervals, the length of said slits being made larger every at least two slits, thereby to form a series of unslit connecting portions in both side end portions of said plate, of which width is made narrower at predetermined intervals in accordance with the length of said slits; and by rolling said series of unslit connecting portions in a longitudinal direction of said plate so as to make said connecting portions thin and enlarge said transversely extending slits into slots having a predetermined width in a longitudinal direction of said plate;

covering said core member with a covering material to form a covered core member;

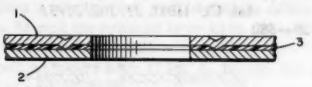
applying a bending force to said covered core member in a vertical direction thereof to break said core member in said narrower connecting portions in a transverse direction of said member and to divide said core member into a plurality of core pieces within said covering material; and

bending said plurality of core pieces divided within said covering material to form a channel-shaped trim having a longitudinally extending opening for embracing and clamping an edge flange of a support member.

4,333,222
METHOD OF ELIMINATING CREEP IN SCREW JOINTS OR RIVETED JOINTS

Lars E. Melin, Lulea, Sweden, assignor to Antiphon AB, Sundbyberg, Sweden

Filed Jan. 21, 1980, Ser. No. 113,676
Claims priority, application Sweden, Jan. 26, 1979, 7900699
Int. Cl.³ B23P *9/00, 19/00*
U.S. Cl. 29—445 **2 Claims**

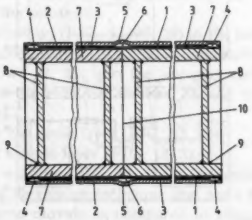


2. A method for reducing relative movement between laminates of a laminated article comprising first and second facing metal sheets and an intermediate plastic or rubber vibration damping material joined together into a unit under compression with at least one screw or rivet, said method comprising joining said metal sheets with said damping material therebetween under compression with at least one screw or rivet; and embossing one face of a first metal sheet inwardly towards the intermediate material under a pressure which forces the protruding portion on an opposite face of the metal sheet through a intermediate layer and into contact with the second first metal sheet adjacent to said screw or rivet to fix the metal sheets against relative movement toward each other.

4,333,223
SHIELDING CYLINDER AND METHOD OF MANUFACTURE

Willy Germann, Wurenlos, Switzerland, assignor to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Division of Ser. No. 5,915, Jan. 23, 1979, abandoned. This application Apr. 1, 1980, Ser. No. 136,349
Claims priority, application Switzerland, Jan. 25, 1978, 788/78
Int. Cl.³ B23P *11/02*
U.S. Cl. 29—447 **6 Claims**

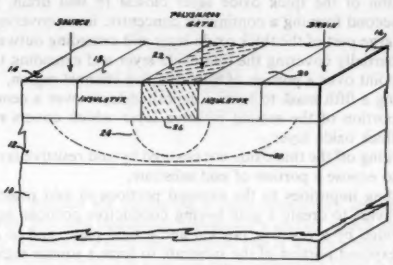


1. A method for manufacturing a shielding cylinder for an electrical machine having a superconductive excitation winding, the method comprising the steps of:
heat-shrinking an inner cylindrical member onto a mandrel;
machining an outer surface of the inner cylindrical member wherein axial ducts are machined into the outer surface of the inner cylindrical member;
machining an inner surface of an outer cylindrical member to provide at least one peripheral duct; and
heat-shrinking the outer cylindrical member onto the inner cylindrical member thereby forming cooling ducts within the shielding cylinder.

4,333,224
METHOD OF FABRICATING POLYSILICON/SILICON JUNCTION FIELD EFFECT TRANSISTORS

Bobby L. Buchanan, 351 Baldwin Rd., Carlisle, Mass. 01741

Continuation of Ser. No. 899,673, Apr. 24, 1978, abandoned. This application May 6, 1980, Ser. No. 147,024
Int. Cl.³ H01L *21/22*
U.S. Cl. 29—571 **2 Claims**

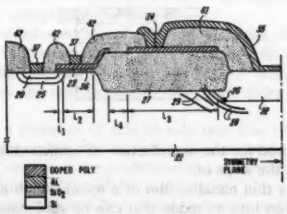


1. The method of fabricating a junction field effect transistor comprising the steps of:
fabricating a silicon epi wafer having a bounding n type silicon substrate and a p type silicon overlay substrate;
thermally growing a layer of silicon dioxide on said overlay substrate;
masking said layer of silicon dioxide to define a gate region;
etching through said layer of silicon dioxide in the gate region to said overlay substrate;
depositing heavily doped polysilicon into said etched gate region;
masking said layer of silicon dioxide to define source and drain contact regions;
etching through said layer of silicon dioxide in said source and drain regions to said overlay substrate; and
evaporating aluminum contacts into said source and drain regions.

4,333,225
METHOD OF MAKING A CIRCULAR HIGH VOLTAGE FIELD EFFECT TRANSISTOR

Keming W. Yeh, Los Angeles, Calif., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 970,679, Dec. 18, 1978. This application Dec. 11, 1980, Ser. No. 215,288
Int. Cl.³ H01L *21/26*
U.S. Cl. 29—571 **18 Claims**



1. The method of making a circular high voltage field effect transistor with a resistive gate on a lightly doped substrate comprising the steps of:
using a first mask and impurities opposite those contained in

the substrate region to form a central circular drain region on the surface of said substrate,

using a second mask to grow a concentric thick oxide layer on said substrate surface immediately outside said drain region, and then removing said second mask,

growing a thin oxide layer on the surface of said substrate immediately outside said thick oxide layer,

using a third mask to form an effective channel region under said thin oxide at a radial distance from said thick oxide layer by doping said substrate with impurities,

using a fourth mask to deposit two separate resistive layers, the first comprising a short concentric band on that portion of the thick oxide layer closest to said drain, the second forming a continuous concentric layer covering a large part of the thick oxide layer and extending outward, partially covering the thin oxide layer and extending to a point over a portion of said effective channel region,

using a fifth mask to form a deposited layer over a central portion of the second resistive layer which covers said thick oxide layer,

etching off the thin oxide not covered by said resistive layers to expose a portion of said substrate,

adding impurities to the exposed portions of said resistive layers to create a gate having conductive portions separated by a resistive portion and a field plate, and to the exposed portion of the substrate to form a source region,

removing said deposited layer,

using a sixth mask to cover with an insulating layer all except the central portions of said source, said conductive portion of said gate, said field plate, and said drain, and

using a seventh mask to apply metalization to said central portions to enable circuit connections thereto.

4,333,226

METHOD OF FORMING PATTERNED REFRACTORY METAL FILMS BY SELECTIVE OXYGEN IMPLANT AND SUBLIMATION

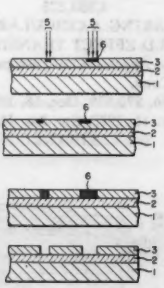
Haruhiko Abe, Takarazuka; Masao Nagatomo, Itami; Natsuro Tsubouchi; Hiroshi Harada, both of Kawanishi, and Junichi Mitsuhashi, Sakai, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Nov. 24, 1980, Ser. No. 209,889

Claims priority, application Japan, Nov. 30, 1979, 54/156504

Int. Cl.[3] **B05D** *3/06, 5/12;* **H01L** *21/312*

U.S. Cl. 29—576 B **15 Claims**



1. A method for the manufacture of semiconductor devices comprising the steps of;

forming a thin metallic film of a metal which is capable of oxidation into an oxide that can be sublimated at a high temperature, on a major surface of a semiconductor substrate;

irradiating an oxygen ion beam on a major surface of said thin metallic film in a predetermined pattern to implant the oxygen ions therein and to change the metal in the implanted portion to the oxide, said predetermined pattern corresponding to a negative of a desired pattern into which said thin metallic film is to be formed; and

heating said thin metallic film to an elevated temperature effective to remove by sublimation the oxidized portions to form the desired pattern with the remaining thin metallic film.

4,333,227

PROCESS FOR FABRICATING A SELF-ALIGNED MICROMETER BIPOLAR TRANSISTOR DEVICE

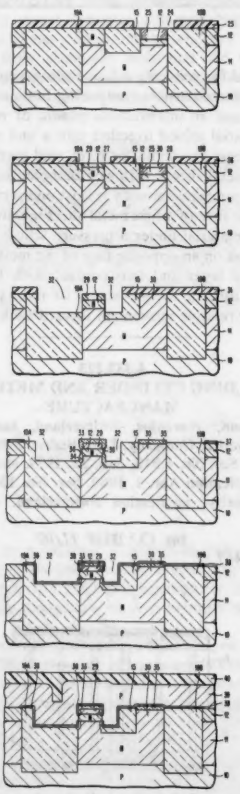
Cheng T. Horng, San Jose, Calif.; Michael R. Poponiak, Newburgh; Hans S. Rupprecht, Yorktown Heights, both of N.Y., and Robert O. Schwenker, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 98,588, Nov. 29, 1979, Pat. No. 4,303,933.

This application Jan. 12, 1981, Ser. No. 224,705

Int. Cl.[3] **H01L** *21/302, 21/31*

U.S. Cl. 29—580 **6 Claims**



1. In a method of fabricating a planar vertical bipolar transistor structure on a silicon substrate of a first conductivity type having a planar surface, said structure including, a shallow depth epitaxial layer upon one surface of said substrate, said epitaxial layer having a substantially flat exposed top surface, an emitter region formed in said epitaxial layer, said emitter region having an exposed essentially planar surface, a base region formed in said epitaxial layer beneath said emitter region to provide a base-emitter junction, a collector region formed at least in part in said epitaxial layer beneath said base region to provide a base-collector junction, said structure

having a said base-emitter junction which is essentially flat and has an area in the order of one square micron, said base-collector junction residing directly beneath and uniformly spaced from said base-emitter junction, and said base-collector junction being essentially flat and having an area in the order of one square micron, said method including the following steps:

(S1) introduce impurities of a second conductivity type into said planar surface of said substrate (FIG. 2, 10) to form a subcollector 11;

(S2) deposit an epitaxial layer (FIG. 3, 12) of a second conductivity type on said planar surface of said substrate;

(S3) deposit an oxide layer (FIG. 4, 13) on said planar surface of said substrate;

(S4) deposit a resist layer (FIG. 4, 14) on said oxide layer 13;

(S5) open a window (FIG. 4, 15) in said resist layer 14 and said oxide layer 13;

(S6) utilizing a reactive ion etch technique (FIG. 5) and window 15 etch the epitaxial layer 12 to the subcollector region 11 to provide a shallow trench;

(S7) deposit an oxide layer (FIG. 6, 16) on the exposed surface of said substrate;

(S8) deposit a resist layer (FIG. 6, 17) on said oxide layer 16;

(S9) open windows (FIG. 6, 18A, 18B) in said resist layer 17 and said oxide layer 16;

(S10) remove resist layer (FIG. 7, 17);

(S11) utilizing said oxide layer as a mask, employ a reactive ion etching technique to provide the enclosed deep trench (FIG. 7, 19A, 19B), the etching is stopped when it reaches the substrate 10;

(S12) remove the oxide layer (FIG. 7, 16);

(S13) deposit a thin oxide layer (FIG. 8, 20) on the exposed surface of the substrate;

(S14) deposit a thick oxide layer (FIG. 9, 21) to fill the shallow trench and deep trench (19A, 19B), said thick oxide layer 21 also substantially planarizing said exposed surface of said substrate;

(S15) deposit and utilize a blanket resist layer (FIG. 9, 22) on said thick oxide layer 21 to further planarize said exposed surface of said substrate;

(S16) reactive ion etch the exposed surface of the substrate to the surface of the epitaxial layer (FIG. 10, 12);

(S17) deposit a resist layer (FIG. 11, 23) and form an opening 24 in said layer;

(S18) introduce impurities of the second conductivity type via said window (FIG. 11, 24) into the epitaxial layer 12 to form reach through region 25;

(S19) remove the resist layer (FIG. 11, 23);

(S20) deposit a resist layer (FIG. 12, 26) on the exposed surface of the substrate;

(S21) form windows (FIG. 12, 27, 28) in the resist layer 26;

(S22) introduce impurities of a second conductivity type, via said windows 27, 28, into the exposed surface of said substrate to provide the emitter 29 and the collector contact 30;

(S23) remove the resist layer (FIG. 12, 26);

(S24) deposit a resist layer (FIG. 13, 31);

(S25) form a window (FIG. 13, 32) in the resist layer 31;

(S26) utilizing an etching technique that has a high etching rate of silicon dioxide as compared to silicon remove a portion of the shallow trench 15 and a portion of the deep trench (FIG. 13, 19A);

(S27) remove the resist layer (FIG. 13, 31);

(S28) and thermally oxidize at a relatively low temperature the exposed surface of the substrate, whereby the low temperature oxidation results in forming thick oxide layers (FIG. 14, 33, 34 and 35) over the emitter 29, subcollector 11 and collector reach through contact 30, and the low temperature oxidation results in relatively thin oxide layers 36 and 37 on the lightly doped sidewall base contact and surface of the epitaxial layer 12.

4,333,228

METHOD FOR PRODUCING A SUPER-CONDUCTIVE COIL AND COIL PRODUCED IN ACCORDANCE WITH THIS METHOD

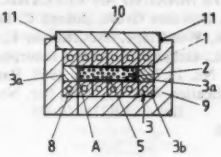
Alfred Koch, Bremgarten, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Oct. 23, 1979, Ser. No. 87,342

Claims priority, application Switzerland, Dec. 22, 1978, 13071/78

Int. Cl.³ H01L *39/24*

U.S. Cl. 29—599 **5 Claims**



1. A method for producing a super-conductive coil to be formed as a coil conductor containing a carrier which essentially consists of a stabilizing material and in which a main duct is provided in which at least one super-conductor cable is to be embedded in a joining material, comprising:

loosely inserting the super-conductor cable into the main duct;

shaping the carrier into the shape of a coil; and

completely filling the main duct having the super-conductor cable with the joining material.

4,333,229

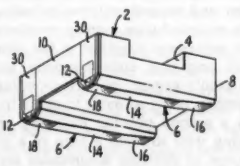
METHOD OF MANUFACTURING THIN FILM MAGNETIC HEAD/SLIDER COMBINATION

Michael L. Ellenberger, Santa Cruz, Calif., assignor to Memorex Corporation, Santa Clara, Calif.

Filed Jul. 21, 1980, Ser. No. 170,479

Int. Cl.³ G11B *5/42*

U.S. Cl. 29—603 **7 Claims**



1. A method of manufacturing a thin film magnetic recording and playback head/slider combination having an air bearing structure, comprising the steps of

on an extended member of substrate material, forming at least two intersecting elongated surfaces, a first said surface being flat, and a second said surface being flat and defined as the rear surface of said head/slider combination;

depositing a plurality of side-by-side thin film transducers onto said member rear surface and positioned relative to said first surface in the predetermined relationship desired for the finished head/slider combination;

forming recesses in said first surface between said transducers, the recesses so formed intersecting both said rear surface and a third surface of said member defined as the front surface thereof, whereby are formed a plurality of rails extending between the member front and rear surfaces and including said first surfaces, at least some of which rails have a transducer at the rear end thereof; and

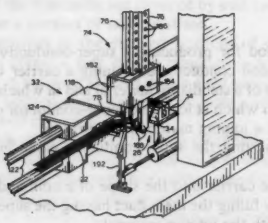
forming on each said rail an air bearing surface and taper extending longitudinally of said rail between said first surface and said forward surface, said air bearing surface intersecting said first surface and being inclined away from said first surface and being formed by abrading said rail at an angle to said first surface until said intersection of said air bearing surface and said first surface is a predetermined distance from said member rear surface, and said taper extending from said air bearing surface to said member forward surface.

4,333,230

MACHINE FOR MAKING AN ELECTRICAL HARNESS

Jack F. Funcik, Downers Grove; Joseph C. Bennet, Lisle; Joseph T. Tubbs, Woodridge, and Thomas E. Schneider, Burbank, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Division of Ser. No. 12,715, Feb. 16, 1980, Pat. No. 4,235,015.
This application Aug. 11, 1980, Ser. No. 176,857
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—749 **3 Claims**



1. In a machine for making electrical harness,
said harness comprising at least one connector with insulation displacement type contacts loaded therein, each contact connected to an insulation clad wire, said wires generally being of different lengths,
said machine including a first station whereat a connector is positioned, insertion means for simultaneously displacing each wire into its corresponding contact, a second station having holding means for selectively gripping said wires and means for cutting said wires, a looping assembly intermediate said first and second stations including a plurality of reciprocally mounted wire looping members secured to one another for movement together in the same direction and having wire engaging ends normally spaced from and adapted to axially engage its corresponding wire, the wire looping members being actuable to move from a first spaced position to a second position engaging and forcing each corresponding wire to form a loop of a given magnitude, whereby loops of different magnitudes are formed in said wires, and control means for sequentially actuating said insertion means, holding means, wire cutting means and looping assembly in a given order, the improvement in said looping assembly comprising:
said wire looping members being staggered in the axial directions of said wires and mounted relative to one another so that said wire engaging ends initially engage each respective wire at different distances from the connector.

4,333,231

WIRE RELEASE TOOL

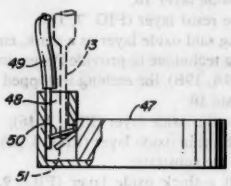
Homer E. Yeargin, 7004 N. 11th Pl., Phoeniz, Ariz. 85020

Continuation-in-part of Ser. No. 7,041, Jan. 29, 1979, abandoned. This application Jun. 25, 1980, Ser. No. 162,680
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—764 **9 Claims**

1. A wire release tool for releasing stripped conductors from sockets within electrical devices of the type utilizing spring-biased detent tongues to engage stripped conductors inserted within the sockets thereof, the spring-biased detent tongues normally preventing withdrawal of the stripped conductors from the sockets, the electrical devices being of the type which include access openings of either circular or rectangular shape adjacent the sockets thereof to afford access to said detent tongues, the circular access openings having a predetermined diameter and a first predetermined depth, the rectangular access openings having a predetermined length and width and a second predetermined depth, said wire release tool comprising in combination:

a. a central core of metal having first and second ends;

b. a metal pin for traversing one of said circular access openings and contacting one of said spring-biased detent tongues in engagement with a stripped conductor and biasing said tongue away fron said conductor, said metal pin extending longitudinally from the first end of said central core, said metal pin having a working end opposite the first end of said central core, the working end having a uniformly circular cross-section along its length having a diameter substantially equal to said predetermined diameter and said working end having a length in excess of said first predetermined depth for allowing said working end of said metal pin to be inserted into a circular access opening of an electrical device of the type which includes



circular access openings to a sufficient depth to bias the detent tongue away from the stripped conductor inserted within the socket adjacent the circular access opening;

c. a metal blade for traversing one of said rectangular access openings and contacting one of said spring-biased detent tongues in engagement with a stripped conductor and biasing said tongue away from said conductor, said metal blade extending longitudinally from the second end of said central core, said metal blade having a working end opposite the second end of said central core, said working end having a uniformly rectangular cross-section along its length, the rectangular cross-section having a length and width substantially equal to said predetermined length and width, respectively, and said working end having a length in excess of said second predetermined depth for allowing said working end of said metal blade to be inserted into a rectangular access opening of an electrical device of the type which includes rectangular access openings to a sufficient depth to bias the detent tongue away from the stripped conductor inserted within the socket adjacent the rectangular access opening; and

d. a body of electrically insulating material formed about and secured to said central core of metal.

4,333,232

APPARATUS FOR FORMING FLYPIECE AND SLIDE FASTENER CHAIN ASSEMBLY

David A. Orr, Union City; Hiren S. Gala, Erie, and George J. Scagnelli, Meadville, all of Pa., assignors to Talon, Inc., Meadville, Pa.

Division of Ser. No. 909,863, May 26, 1978, Pat. No. 4,236,292.
This application Jun. 27, 1980, Ser. No. 163,454
Int. Cl.³ B29D *5/00*
U.S. Cl. 29—767 **5 Claims**

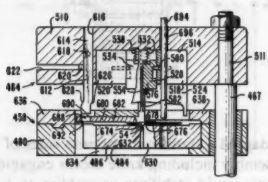
1. An apparatus for gapping and applying a bottom stop to a section of slide fastener chain comprising

a bottom stop machine for applying staple-like bottom stops to a slide fastener chain;

a movable punch assembly mounted in juxtaposition to the bottom stop applying machine and including a slide fastener element gapping punch blade aligned with the bottom stop applying machine and extending from a point adjacent the bottom stop applying machine;

a common base assembly extending under both the punch assembly and the bottom stop machine and including an anvil portion under the bottom stop applying machine, a die portion with a die opening under the punch assembly for cooperating with the gapping punch blade, a pair of parallel ridges extending along opposite sides of the die opening and forming a channel between the ridges for receiving and holding bottom portions of fastener elements of the slide fastener chain centrally aligned over the die opening and aligned with the anvil portion;

means for advancing the slide fastener chain into the common base assembly;



means operated by the punch assembly for positioning and holding the fastening elements in the channel when the punch assembly is in the down position and for releasing the fastening elements when the punch assembly is in a raised position, said means including a plate slidably mounted in the common base assembly for movement transverse to the longitudinal dimension of the slide fastener chain from a retracted position to an advanced position to engage the fastening elements of the slide fastener chain and to position and secure the engaged fastener elements within the channel; and

operating means for moving the punch assembly downward to operate the positioning and holding means and to punch portions of slide fastener elements from the slide fastener chain and for operating the bottom stop applying machine for applying a bottom stop to the slide fastener chain when the punch assembly is in the down position.

4,333,233

MACHINES AND METHOD APPLICABLE TO THE MANUFACTURE OF ELECTRICAL AND LIKE DEVICES

Peter J. Dodson, Cheshunt, and Kenneth E. Horwood, Basildon, both of England, assignors to Guardall Limited, Enfield, England

Filed Feb. 19, 1980, Ser. No. 122,895

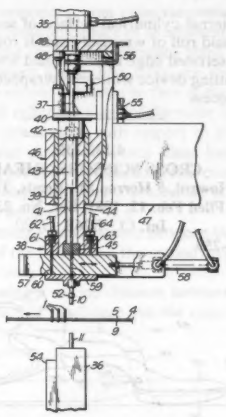
Claims priority, application United Kingdom, Feb. 19, 1979, 7905697

Int. Cl.³ H05K *3/32*; B23P *3/32*

U.S. Cl. 29—845 **13 Claims**

1. In a method for inserting components into a board, in which a component-insertion head and the board are brought into contact one with the other where a said component is to be inserted, and including repeated execution of steps which comprise a first step of charging the head with a component via a reciprocated shuttle and a second step of driving the component from the head into the board, said first step including loading a component on the shuttle when the reciprocated shuttle is at the end of a first of the two strokes of its reciprocating movement and through the second of said strokes of the reciprocated shuttle translating this component as so loaded on the shuttle to said head to charge said head therewith, the improvement wherein said first step also includes loading a component on the shuttle when the shuttle is at the end of its said second stroke and through the said first stroke of the reciprocated shuttle translating this component as so loaded on the shuttle to said head to charge said head therewith, the shuttle being reciprocated to execute its said first and second strokes in response to successive executions respectively of said second step.

4. In a machine for inserting pins into a board, said machine including a pin-insertion head, a reciprocating shuttle having a pin-receiving aperture therein for translating pins loaded in said aperture to the said head one at a time, pin-loading means operative when the shuttle is in a first position to load a pin into said aperture of the shuttle, the shuttle being moved in one stroke of its reciprocating movement by a predetermined distance from the said first position to occupy a second position in which said aperture is aligned with the said head so as to



translate the loaded pin to the said head for insertion therefrom into said board, and said shuttle being moved in a return stroke of its reciprocating movement back to its said first position for reloading from the said pin-loading means with another of said pins, the improvement wherein the shuttle has a further pin-receiving aperture therein spaced from the first-mentioned aperture by an amount measured in the direction of said first hole equal to said distance, and wherein the machine includes further pin-loading means spaced effectively from the first-mentioned pin-loading means by an amount in said direction equal to twice said distance, said further pin-loading means being operative when the shuttle is in its said second position to load the shuttle with a pin for translation to the said head during the said return stroke of the shuttle so that an individual pin is translated to the said head for insertion therefrom into the board upon each stroke of the shuttle.

4,333,234

PAPER SLITTING DEVICE

Dean C. Smith, 2301 Rodney Dr., and Gary F. Quinton, 1261 Skyline Blvd., both of Reno, Nev. 89509

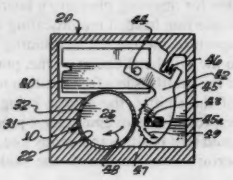
Filed Sep. 17, 1980, Ser. No. 188,080

Int. Cl.³ B26B *27/00*

U.S. Cl. 30—2 **1 Claim**

1. A paper slitting device for slitting the side wall of a wrapped roll of coins which comprises: a housing means, said housing means having a cylindrical opening therein terminating in an end wall; a slot in said housing means communicating with said cylindrical opening at a point near said end wall and on a plane normal to a longitudinal axis of said cylindrical opening; a lever means mounted within said slot and said lever means pivotally mounted within said slot at a point parallel to, but offset, from the axis of said cylindrical opening; a semi-cir-

cular segment of said lever having a serrated edge means projecting into said cylindrical opening so as to frictionally engage the external cylindrical surface of a roll of wrapped coins; a paper slitting device affixed to said lever means at an end of said lever means so as to be able to come into contact



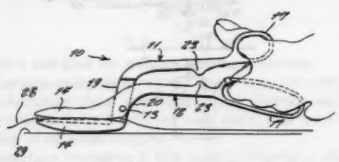
with said external cylindrical surface of said roll of wrapped coins when said roll of wrapped coins is rotated in a direction toward said serrated edge means of said lever and away from said paper slitting device while said wrapped roll is within said cylindrical recess.

4,333,235

CROSS SCISSORS/SHEARS

Marvin M. Howard, 5 Herron St., Bemis, Tenn. 38314

Filed Feb. 12, 1981, Ser. No. 233,787
Int. Cl.³ B26B *13/20*
U.S. Cl. 30—259 **1 Claim**



1. A double cross scissors/shears, comprising in combination, a pair of crossing levers having corresponding cutting blades at one end and corresponding handles at an opposite end, a pivot screw holding said levers together, and a double offset intermediate portion on each said lever, said pivot screw being through said double offset portions; each said double offset portion being formed by a pair of bends in opposite directions, so that said handles are both at a higher elevation than said blades, when in use cutting a material laid flat on a cutting surface; a protrusion on each said handle abutting each other when said scissors/shears are in a closed position; each said handle including a loop around a hole for receiving either a thumb or the fingers of a persons hand, a rotatable ring around one said loop having loop pile on a portion of an outer side thereof which in one rotated position abuts a corresponding loop pile stationarily affixed on the other said handle loop, when said scissors/shears are in said closed position.

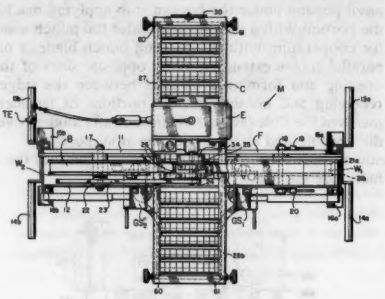
4,333,236

PORTABLE BOARD MILL

Joseph R. Lovas, East Stroudsburg, Pa.; Paul J. Lovas, Blairstown, N.J., and Carl F. Koelmel, East Stroudsburg, Pa., assignors to Cyloflex, Inc., East Stroudsburg, Pa.

Division of Ser. No. 94,433, Nov. 15, 1979, Pat. No. 4,276,693. This application Mar. 18, 1980, Ser. No. 245,037
Int. Cl.³ B27B *15/02*
U.S. Cl. 30—380 **5 Claims**

1. In a portable mill for cutting lumber from a log, including a frame adapted to be disposed transverse to the log, a pair of wheels mounted for rotation in a vertical plane in said frame, a band saw blade trained around said wheels, means for rotating at least one of said wheels to cause the blade to form a cut in the log, and a carriage carried by said frame to afford movement of the frame along the log as the blade advances to cut the log lengthwise, the improvement comprising: stabilizer means carried by said frame behind said cutting blade in the plane thereof for engaging in the cut made by the blade to restrain motion of the frame as it advances lengthwise of the log during cutting, said blade stabilizer means including a pair of stabilizer assemblies disposed in spaced relation on the trailing side of the



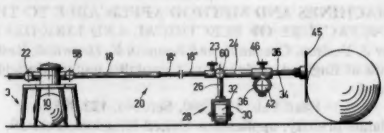
frame and adapted to confront opposite sides of the log, each stabilizer assembly including knife means engaging in said cut, means mounting said stabilizer assemblies to said frame for movement toward and away from one another, and means cooperating with said stabilizer assemblies for biasing them toward one another for causing their knife means to engage in said cut, whereby the knife means cooperates with the blade to provide a substantially flat cut in the log.

4,333,237

APPARATUS FOR COMPARING THE DISTANCE OF TWO BALLS FROM A THIRD BALL

Nazzareno E. Carbone, Viale S. Martino, Isol. 12, Messina, Italy

Filed Jan. 5, 1981, Ser. No. 222,526
Claims priority, application Italy, Jan. 3, 1980, 18701 A/80; Dec. 22, 1980, 50444 A/80
Int. Cl.³ G01B *5/14*
U.S. Cl. 33—143 R **2 Claims**

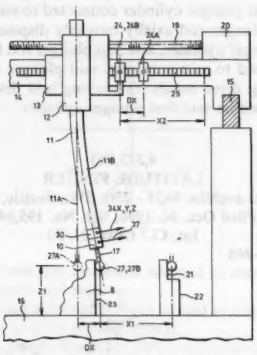


1. An apparatus for comparing the distances between a first ball and other balls all lying on the same substantially horizontal plane, said apparatus comprising a stand having a plate supported by legs which stand will fit over the first ball, a rotatable hub supported by said plate and extending outwardly above said plate, a telescopic rod mounted on said hub for rotation in a horizontal plane, said rod being extensible to the positions of said other balls and a means for centering said stand over said first ball, said centering means including a ring of distinctive color around the upper edge of said hub, a circular flat disk of transparent material embedded in said plate, and two rings of different color concentric with the disk and traced in said disk, one of said rings having about the same diameter as said ring around the hub and the other having about the same diameter of said first ball.

4,333,238
COORDINATE MEASURING MACHINE

David R. McMurtry, 'Undercroft', Wotton-under-Edge, Gloucestershire, England

Filed Mar. 31, 1980, Ser. No. 136,091
Claims priority, application United Kingdom, Mar. 30, 1979, 7911329
Int. Cl.[3] G01B 7/00, 7/28
U.S. Cl. 33—174 L 3 Claims



1. A method of determining a measurement of a workpiece on a machine comprising a probe, structure supporting said probe for flexile and translational movement relative to a workpiece to be measured and relative to a means for continually measuring the position of the probe relative to a datum, the probe having means for generating a signal when having a predetermined relationship with a proximate surface of the workpiece; said method comprising the steps of:

(a) moving said probe toward said surface;

(b) determining the output of said measuring means at the instant said signal is generated thereby defining the measured position of said probe;

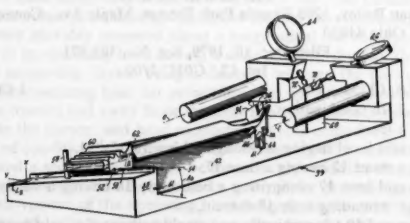
(c) determining the deflection of said structure at said instant thereby defining the difference between the measured and the actual positions of said probe; and

(d) subtracting said difference to said output of the measuring means to establish a measure of the actual position of said probe.

4,333,239
METHOD AND APPARATUS FOR INSPECTING SHROUDS OF ROTOR BLADES

John P. Arrigoni, Wallingford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 2, 1980, Ser. No. 155,253
Int. Cl.[3] G01B 5/02, 5/25
U.S. Cl. 33—174 C 15 Claims



4. A fixture for inspecting a rotor blade of an array of rotor blades of the type found in an axial flow rotary machine, each blade including a root, an airfoil, a shroud attached to the airfoil, each shroud having a shroud reference plane, a notch face, a cross notch face on the other side of the shroud which corresponds to the notch face, a cross notch dimension measured along a line perpendicular to the notch face and the cross notch face, first and second tangential faces, first and second cross tangential faces on the other side of the shroud which correspond to the first and second tangential faces, a cross shroud dimension measured along a line perpendicular to the first tangential face and the second cross tangential face, which comprises:

locator means on the fixture having a first reference surface which is adapted to engage the first tangential face of the rotor blade and having a second reference surface on the fixture which is adapted to engage the notch face of the rotor blade, the reference surfaces being disposed such that the angle between the surfaces is equal to the angle between a corresponding first cross tangential face and a corresponding cross notch face of an adjacent rotor blade;

means for orienting the shroud reference plane of the rotor blade with respect to the first reference surface of the fixture and the second reference surface of the fixture such that the shroud reference plane of the rotor blade has the same angular relationship with respect to the reference surfaces that the shroud reference plane has in the machine with respect to a corresponding first cross tangential face and a corresponding cross notch face of an adjacent blade made to design;

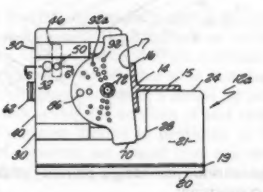
means for measuring a first distance between the first reference surface of the fixture and the second cross tangential face of the shroud;

means for measuring a second distance between the second reference surface of the fixture and the cross notch face.

4,333,240
INSPECTION DEVICE FOR MEASURING THE CONTOUR AND/OR ANGULAR TOLERANCE OF A PART

Eugene S. Searcy, Terlton, Okla., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 16, 1980, Ser. No. 150,540
Int. Cl.[3] G01B 5/20
U.S. Cl. 33—174 G 10 Claims



1. A device for inspecting whether the surface of a discrete portion of a part is within allowable tolerance comprising:

a base adapted to position said part for inspection;

a probe moveably connected to said base for oscillatory movement relative to said base and adapted to engage said surface; and

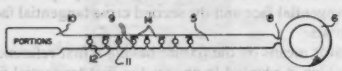
probe limiting means associated with said base and said probe for limiting the movement of said probe to said allowable tolerance of said surface;

such that when said part is positioned for inspection on said base, said probe will indicate whether said surface is within allowable tolerance by making contact therewith.

4,333,241
PASTA MEASURER

Ronald J. Wasik, and Janice E. Wasik, both of 544 Forest Hill Dr., Kitchener, Ontario, Canada

Filed Mar. 24, 1981, Ser. No. 247,222
Int. Cl.³ G01B 3/02
U.S. Cl. 33—174 T 2 Claims



1. A measuring device for accurately measuring the amount of uncooked spaghetti or vermicelli or the like required to produce a given volume of cooked pasta comprising:

a flexible measuring tape having a series of calibrations to show directly the amount of uncooked said pasta required to yield a given number of cooked portions;

a ring device on one end of said tape;

a reference point for said calibrations toward the ring end of said tape, said reference point comprising a portion of said tape narrowed to form a neck symmetrical about the longitudinal centre-line of the flat side of said tape;

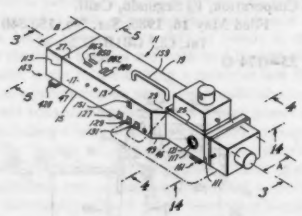
said calibrations comprising a series of holes through said tape along the longitudinal centre line of the flat side thereof, each said hole accessible to an edge of said tape through a discontinuity in said tape adjacent each said hole, each said discontinuity comprising substantially a hair line break in said tape and terminating in a notched configuration at said edge;

whereby said tape may be removeably locked into a selected one of said calibrations by insertion of said reference point into said selected calibration through the appropriate said discontinuity.

4,333,242
CONSTRUCTION LASER

Robert K. Genho, Sr., Houston, Tex., assignor to Lasertron Company, Houston, Tex.

Filed May 7, 1979, Ser. No. 36,663
Int. Cl.³ G02B 7/14; G01B 11/26
U.S. Cl. 33—227 6 Claims



1. An apparatus for providing a plurality of detectable reference lines, comprising:

an elongate housing;

a source of a coherent source beam of light positioned within said housing;

a beam splitter for splitting said source beam into a first beam directed along a first axis and a second beam directed along a second axis;

support means for supporting said housing on a surface, said support means including a plurality of feet for contacting such surface and adjustment means for adjusting the orientation of said housing with respect to said surface without substantially changing the position of said feet with respect to said surface;

grade control means for detecting the orientation of said first and second axes with respect to the horizontal and adjusting said adjustment means in accordance with such detection;

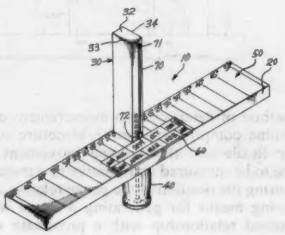
wherein said adjustment means includes a front support mechanism pivotally connected to one end of said housing, said front support mechanism including three perpendicular pivot axes; and

wherein said adjustment means includes a base unit fixedly attached to said feet and plunger means for connecting said base unit to said housing, said plunger means including a first plunger cylinder connected to said housing and a first plunger rod axially movably disposed within said first plunger cylinder, said first plunger rod being attached at one end to said base unit, said plunger means further including drive means for moving said first plunger rod axially within said first plunger cylinder.

4,333,243
LATITUDE FINDER

Harry P. McLaughlin, 4431 - 25th SW., Seattle, Wash. 98166

Filed Oct. 10, 1980, Ser. No. 195,844
Int. Cl.³ G01C 21/20
U.S. Cl. 33—268 5 Claims



1. An apparatus for indicating the latitude position of the user comprising:

(a) a planar base member having both a scale having degrees and a scale having the days of the year marked on its top surface;

(b) a vertical member extending perpendicularly upwardly from the base member; and,

(c) pendulum means carried on the vertical member alignable with the current day date when the planar base member is oriented in a meridian plane in a north-south direction and rotated in the vertical plane such that when the pendulum means is so aligned, the end of the shadow on the scale having degrees marked thereon cast by the vertical member from the noon sun indicates the latitude position of the user.

4,333,244
LEVELING STAND

Ivan Bailey, 3205 Pamala Park Estates, Maple Ave., Conneaut, Ohio 44030

Filed Dec. 10, 1979, Ser. No. 101,871
Int. Cl.³ G01C 5/00
U.S. Cl. 33—290 1 Claim

1. In combination,

a level,

said level having an elongated level body **11**,

a stand **12** having a base **17**,

said base **17** comprising a base body **16** having a vertically extending bore **18** therein,

a rod **19** telescopically and rotably received in said bore **16**,

support means **24** supported onto said rod,

said base body **16** having at least three legs, swingably attached thereto to swing from a folded position to an erect position and to rest on the ground,

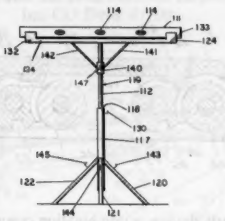
said legs being telescopic whereby the length thereof can be adjusted for adjusting the level of said rod and said level body,

spaced brackets fixed to said support means,

said brackets each comprising a horizontal web member fixed to said support means,

a first jaw member and second jaw member,

said jaw members extending upwardly, fixed to said web and defining a space there-between, and threaded clamp



means on said jaw members, adapted to clamp said level body between said jaws,

and two spaced rifle sights fixed to said brackets for establishing the level of distant objects,

said support means comprising a turntable level holder pivotably supported on said telescoping rod,

a sleeve rotatably supported on said rod below said level holder and base rod attached to said sleeve and to said level holder whereby said level can be swung around said body.

4,333,245

HEAD SUPPORTING DEVICE FOR UNIVERSAL PARALLEL RULER

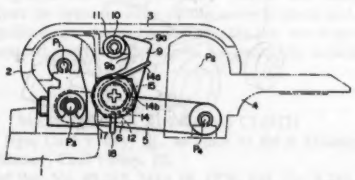
Shigeo Iseya, Tsurugashima, and Giichi Utagawa, Tokyo, both of Japan, assignors to Asahi Seimitsu Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1980, Ser. No. 198,646

Claims priority, application Japar Nov. 6, 1979, 54/143668

Int. Cl.³ B43L *13/02*

U.S. Cl. 33—438 **5 Claims**



1. A head supporting device for use with a universal parallel ruler attached to a drawing board, the parallel ruler including a cursor movably mounted along a longitudinal rail and coupled to an operating head having a scale attached thereto, the head supporting device being connected between the cursor and the operating head for permitting said operating head to move toward and away from the drawing board surface relative to the cursor, said head supporting device comprising:

lifted condition holding member means having a first surface and a second surface and being rotatably mounted along an axis substantially parallel to said rail for preventing a movement of the operating head away from the drawing board surface relative to the cursor when the universal parallel ruler is in a position nearest to the drawing board surface and an external force is not applied thereto and for retaining said operating head in a lifted condition when the universal ruler is in a position farthest from the drawing board and permitting a movement of the operating head toward the drawing board relative to the cursor when the universal parallel ruler is in a position farthest from the drawing board surface and an external force is applied thereto;

rolling member means rotatable about a central axis substantially parallel to said axis for engaging with said first surface of said holding member means when the universal parallel ruler is in said position nearest to the drawing board surface thereby preventing said movement of the head away from the drawing board surface and for engaging with said second surface of said holding member means when the parallel ruler is in said position farthest from the drawing board surface thereby retaining said head in a lifted condition and permitting said movement of the head toward the drawing board surface; and

biasing means for exerting a force on said holding member means thereby forcing said lifted condition holding member means into contact with said rolling member means.

4,333,246

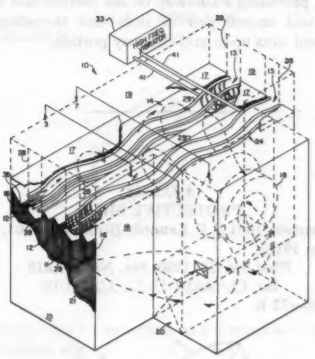
APPARATUS AND METHOD FOR DRYING CAN CLOSURES

Richard W. Sullivan, Denver, and Tuan A. Nguyen, Broomfield, both of Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Oct. 10, 1980, Ser. No. 195,974

Int. Cl.³ F26B *3/04, 25/02*

U.S. Cl. 34—23 **23 Claims**



1. Apparatus for treating articles comprising: a plurality of spaced apart rails between which a stack of articles, set on edge, in abutting face-to-face contact are confined, said rails being disposed relative to one another so as to define a curved path of substantially constant width; a means for pushing said stack longitudinally within the confines of said rails whereby the portions of adjacent articles in proximity to the rail of greater radius of curvature are spaced from one another; and means for directing a treating medium between said spaced article portions.

4,333,247

FOOTWEAR ARTICLE AND PROCESS

Lamberto Marinelli, Potro S. Elpidio, Italy, assignor to TAK PLAST Company, Italy

Filed Dec. 6, 1978, Ser. No. 967,027

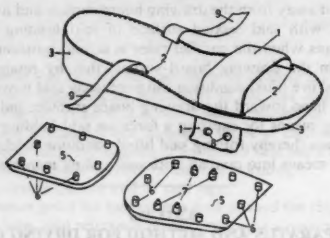
Claims priority, application Italy, Dec. 14, 1977, 644 A/77; Mar. 2, 1978, 607 A/78

Int. Cl.³ A43B *3/12;* A43D *9/00*

U.S. Cl. 36—11.5 **7 Claims**

1. An article of footwear comprising a sole having top and bottom faces, at least two slots disposed on opposed sides of said sole extending through the top and bottom faces, at least

two cut out areas on the bottom face of the sole proximate to said slots, an upper having portions adapted to be threaded through said slots and folded onto said cut out areas, an undersole, and means to connect said undersole to said sole with said portions of said upper securely clamped therebetween. In which the said two slots are disposed near a front toe area of said sole, and two additional slots are provided near the rear heel area of said sole, a cutaway area extending between said



last two additional slots on the bottom face of said sole, and a strap threaded through said two additional slots and running along said last named cutaway area.

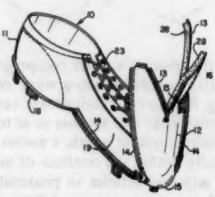
6. The method of claim 5 further including providing a second pair of slots on the sole at the end remote from said first two slots, providing a cutaway on the bottom face extending between said second pair of slots, and threading a strap through said slots upon said cutaway portion.

4,333,248

PROTECTIVE SHOE

Samuel Samuels, 1801 J. F. Kennedy Blvd., Apt. 1001, Philadelphia, Pa. 19103

Filed Jul. 23, 1980, Ser. No. 171,618
Int. Cl.³ A43B *13/22, 3/24, 5/00*
U.S. Cl. 36—72 R **8 Claims**



1. In a protective shoe comprising a toe, welt, instep, laces, sole, and heel, the improvement which comprises:

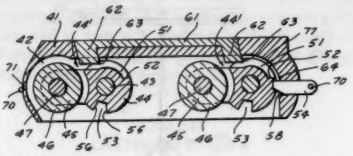
a protective cover, said cover comprising a flexible sheet and a layer of flexible energy absorbing material affixed to the inner surface of said sheet, said protective cover configured to fit over the toe and instep portion of said shoe, said protective cover and said shoe at the welt thereof, each being provided with elements of attaching means, to at least partly remove said protective cover from said shoe, and said protective cover being provided with a central flap portion overlying the laces of said shoe, said flap being provided on each side thereof with one of a pair of selectively operable flap closure means to provide maximum protection to said instep and to provide access to said laces.

4,333,249

CONVERTIBLE SPORTS DEVICE

Hans-Joachim Schaefer, Gymnasiumstrasse 7, D-6380 Bad Homburg, Fed. Rep. of Germany

Continuation of Ser. No. 5,697, Jan. 23, 1979, abandoned, which is a continuation of Ser. No. 821,310, Aug. 2, 1977, abandoned. This application Nov. 21, 1980, Ser. No. 170,806
Int. Cl.³ A43B *5/04*
U.S. Cl. 36—115 **51 Claims**



1. In a sports device, a combination comprising

means forming a housing;

at least one sport member movable relative to said housing between an extended and a retracted position, and having two faces spaced from one another; and

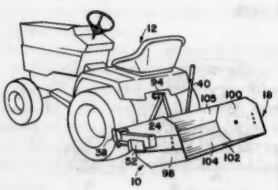
arresting means including an arresting member movable between a first position in which said arresting member abuts against and is in surface contact with one of said faces of said sport member so as to arrest the latter in said extended position, and a second position in which said arresting member abuts against and is in surface contact with the other face of said sport member so as to arrest the latter in said retracted position.

4,333,250

MULTI-PURPOSE ATTACHMENT FOR VEHICLES

Joe W. Henderson, Rte. 2, Box 894, Claremore, Okla. 74017

Filed Sep. 14, 1979, Ser. No. 75,828
Int. Cl.³ E02F *3/62;* A01B *59/042*
U.S. Cl. 37—117.5 **7 Claims**



2. A multi-purpose attachment for vehicles having a lift apparatus and comprising universal carrier means of substantially U-shaped configuration adapted for connection with the lift apparatus of the vehicle, implement means supported by the carrier means, journal means provided on the implement means for pivotally securing the implement to the carrier means, hitch means provided on the carrier means for securing thereof to the lift apparatus, dual latch means provided on said carrier means for cooperating with said journal means for removably securing the implement means to the carrier means, transversely extending rod means provided on said carrier means and rotatable about its own longitudinal axis for simultaneous actuation of said dual latch means, said implement means being a multi-purpose implement pivotal with respect to the carrier means to provide a plurality of relative working positions therebetween, and including locking means cooperating between the multi-purpose implement and the carrier means for locking the multi-purpose implement in each of said positions to provide for said plurality of work operations for the

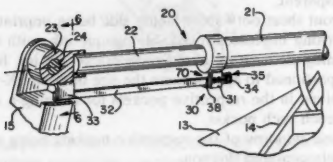
vehicle from a single implement, and including lever means secured to said multi-purpose implement for manual pivoting of said multi-purpose implement with respect to the carrier means.

4,333,251

AUTOMATIC BUCKET LEVELER

Roland E. Weisman, Wilmot, Wis., assignor to International Harvester Co., Chicago, Ill.

Filed Jan. 23, 1981, Ser. No. 227,849
Int. Cl.³ D06F *81/00*
U.S. Cl. 37—118 R **7 Claims**



1. An automatic bucket leveler means for a tractor loader vehicle having a frame, a bucket pivotally mounted to a pair of boom arms pivotally mounted to the frame, a rocking lever pivotally mounted to and between the boom arms and having one end pivotally connected to the bucket and an opposite end pivotally connected to a connecting eye end means of a hydraulic piston rod, the hydraulic piston rod telescopically slidable from an open end of a cylinder tube, the cylinder tube having a closed end pivotally mounted to the frame centrally between the boom arms on a longitudinally extending axis, a first bracket means connected to the cylinder tube and a second bracket means connected to the connecting eye end means of the piston rod for mounting the automatic bucket leveler means thereto on a plane vertically passing through the longitudinal axis, a trip bar connected at one end to the second bracket means and having a free end longitudinally extending toward the first bracket means on the vertical plane, a proximity switch connected to the first bracket means and laterally spaced from the trip bar, and a trip bar guide means mounted to the first bracket means and having guide finger means longitudinally spaced from the proximity switch and laterally spaced apart on opposite sides of the vertical plane and trip bar, the guide finger means maintaining the trip bar in proper laterally spaced apart relationship to the proximity switch.

4,333,252

METHOD FOR PLEATING CLOTH

LaVonne Nye, Coal Valley, Ill., assignor to B&B Miniatures, The Whimsey, Coal Valley, Ill.

Division of Ser. No. 40,263, May 18, 1979, Pat. No. 4,284,215, which is a continuation of Ser. No. 871,916, Jan. 24, 1978, abandoned. This application May 22, 1981, Ser. No. 266,568
Int. Cl.³ D06F *67/04*; A41H *43/00*
U.S. Cl. 38—144 **1 Claim**

1. A method of pleating cloth on a cloth pleater comprising a frame of two side members and two end members and having a series of flat pleating slats, with every slat being engaged by and freely movable along guide means associated with the side members and comprising the steps of:

interweaving the cloth between a number of pairs of slats, each pair defined by a preceding and a succeeding slat in said series;

continuously advancing said succeeding slat to said preceding slat until substantially the entire length of the cloth has been interwoven;

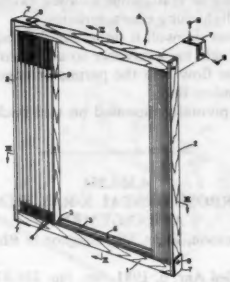
attaching the pleater with the cloth thereon to a rigid supporting surface;

applying steam to one surface of the cloth;

applying steam to the opposite surface of the cloth;

allowing the cloth to dry on the pleater;

removing the cloth from the pleater;



fastening the cloth to said supporting surface;

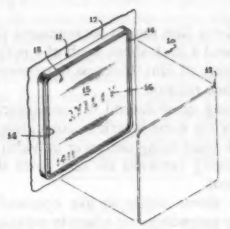
applying steam to the cloth and allowing the cloth to dry on said surface.

4,333,253

DISPLAY SIGN

Andrew K. Cooper, 22635 Flamingo St., Woodland Hills, Calif. 91364

Filed Dec. 26, 1979, Ser. No. 106,447
Int. Cl.³ G09F *3/18*
U.S. Cl. 40—10 R **1 Claim**



1. A display sign for mounting on a vertical wall comprising the combination of:

a single black member or frame providing a rear element or front face carrying a continuous, seamless sidewall about its peripheral edge so as to define a central display area between the opposing wall surfaces of said continuous sidewall;

a display plate substantially occupying said recessed display area;

the peripheral edge of said display plate and the opposing wall surfaces of said continuous sidewall defining a continuous and uninterrupted groove therebetween defining a reveal;

a filler plate occupying said central display recessed area immediately behind said display plate and having edge marginal regions exposed via said reveal;

adhesive means attaching said display plate to said filler plate and said filler plate to said back member;

said display plate having an exposed face or surface surrounded by said reveal carrying indicia for visual observation;

the reverse side of the back member or frame whose surface provides a display area for carrying indicia for visual observation;

said display plate and said back member are molded parts of plastic material;

said marginal region of said filler plate terminates immedi-

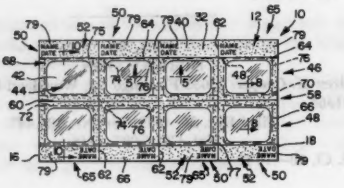
ately adjacent to and in insertable contact with said continuous sidewall;
said adhesive strips spaces said display plate from said filler plate and said filler plate from said rear element of said back member so as to define a closed cavity therebetween providing lightening characteristics;
said continuous sidewall is integrally formed with said rear element of said back member so as to provide contoured corners that flow into the perimeter edge in an uninterrupted seamless line;
a glass door pivotally mounted on said back member sidewall.

4,333,254

MULTIPURPOSE DENTAL X-RAY FILM MOUNT ARRANGEMENT

Charles F. Stevenson, Elgin, Ill., assignor to Rinn Corporation, Elgin, Ill.

Filed Apr. 6, 1981, Ser. No. 251,477
Int. Cl.³ G09F 1/10
U.S. Cl. 40—158 B **9 Claims**



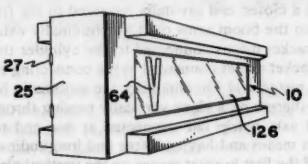
1. A dental X-ray film mount arrangement comprising:
a front sheet and a back sheet, each of a polymeric material and each being of film thickness dimensions and disposed in face to face relation,
said sheets being quadrilateral in configuration and having substantially the same length in coinciding relation,
with said back sheet being narrower in width than said front sheet and being centered on said front sheet along the length thereof,
whereby said sheets define at like opposed ends of same transversely extending end edges in substantially coinciding relation, and define at like opposed sides of same longitudinally extending side edges of which said side edges of said front sheet project beyond the side edges of said back sheet substantially equal amounts,
said front sheet defining an outwardly facing side surface and an inwardly facing side surface facing said back sheet,
said back sheet defining an outwardly facing side surface and an inwardly facing side surface facing said front sheet,
said sheets being bonded together to form a mount assembly by:
a continuous rectilinear weld line coincident and coextensive with the longitudinal centerline of said sheets and extending between said end edges thereof,
a plurality of continuous rectilinear weld lines extending transversely of said sheets between said longitudinally extending side edges of both said sheets and that are spaced apart longitudinally of said sheets to, together with the first mentioned weld line, delineate said assembly into pairs of quadrilateral sections of equal dimensions longitudinally and transversely of said sheets, of which one section of each pair is on one side of said first mentioned weld line and the other section of each pair is on the other side of said first mentioned weld line,
said sheets being indented along said weld lines for making said assembly frangible therealong for effecting manual tear separation of one or more of said sections from said assembly,
a pair of dashed base weld lines disposed one on either side of said first mentioned weld line, extending in parallel, equally spaced, relation thereto and therefrom between said end edges of said sheets,
and for each of said sections, a pair of side dashed weld lines extending transversely of said sheets between said longitudinally extending side edges of said back sheet and the dashed weld line of said pair of base dashed weld lines that extends across the respective said sections,
said sheets being free from securement to each other in the respective sections between said side dashed weld lines therefor for defining in each said section a planar dental X-ray film receiving pocket,
said pockets being of substantially the same size,
with the material from which the front sheet is formed being transparent,
said front sheet outwardly facing side being imprinted with a writing implement markable opaque ink, with said imprinting delineating about each pocket an ink free area proportioned to approximate the size of dental X-ray film received in the respective pockets for forming a window for each such pocket,
with said window of the respective pockets being approximately centered thereon.

4,333,255

ADVERTISING DISPLAY APPARATUS

James C. Ward, Saginaw, Mich., assignor to Ward Outdoor Advertising, Saginaw, Mich.

Filed Aug. 29, 1980, Ser. No. 182,509
Int. Cl.³ G09F 11/12
U.S. Cl. 40—524 **13 Claims**



1. Advertising display apparatus comprising:
a frame;
an endless carrier mounted on said frame for movement in an endless path including at least one curvilinear path portion;
means for driving said carrier in said endless path;
a plurality of individual display panels;
means removably, dependently mounting said display panels on said carrier such that the leading and trailing edge portions of said display panels overlap the adjacent trailing and leading edge portions of adjacent leading and trailing panels, respectively; and
curvilinear guide means for guiding said leading and trailing edge portions of said panels out of the planes of said panels to maintain said edge portions of said panels in overlapping relation as said panels negotiate said curvilinear path portion.

4,333,256

CLOTHES PIN STIRRUP FASTENER FOR UNITARY PISTOL HAND GRIP

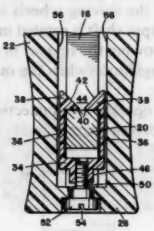
Guy L. Hogue, Atascadero, Calif., assignor to Hogue Combat Grips, Inc., Los Osos, Calif.

Filed Aug. 18, 1980, Ser. No. 178,686
Int. Cl.³ F41C 23/00
U.S. Cl. 42—71 P **6 Claims**

1. A fastener for use in combination with a pistol having a cutout butt frame portion with downwardly extending front and rear members and a foot portion extending between the lower ends of said front and rear members, and a unitary hand

grip covering said butt frame section, said unitary hand grip having a closed bottom, the fastener comprising:

a yoke having a cross bar below said foot portion and upwardly extending side members straddling said foot portion,



locking pawls formed at the upper ends of each of said side members permitting insertion of said foot portion between said yoke side members but preventing the removal of said foot portion once inserted,

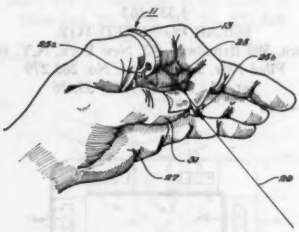
and screw means for securing said unitary hand grip to said cross bar.

4,333,257

METHOD AND FINGER RING DEVICE FOR SNELLING A FISHHOOK

Gordon M. Burrell, 2813 Meadowbrook Dr., Fort Worth, Tex. 76103

Filed Oct. 20, 1980, Ser. No. 198,913
Int. Cl.³ A01K *97/06*
U.S. Cl. 43—57.5 R **5 Claims**



1. A method for snelling a fishhook, comprising:

providing an annular member with an aperture for insertion over a user's finger; the aperture having an axis;

providing a closed loop on the annular member spaced from the aperture;

inserting the annular member over the finger of the user, with the closed loop on the palm side of the user's hand;

inserting a hook portion of a fishhook into the loop to retain the fishhook;

tying a line to an eye of the fishhook while the fishhook is retained by the loop, creating a knot;

tensioning the knot while the fishhook is retained by the loop by pulling the line away from the annular member in a radial direction with respect to the axis of the aperture; and

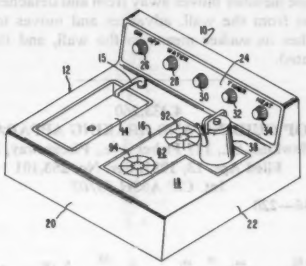
withdrawing the fishhook from the loop.

4,333,258

ELECTRONIC TOY

Robert E. McCaslin, 1227 Coldwater Canyon, Beverly Hills, Calif. 90210

Filed Mar. 23, 1981, Ser. No. 246,557
Int. Cl.³ A63H *3/52, 33/26*
U.S. Cl. 46—14 **8 Claims**



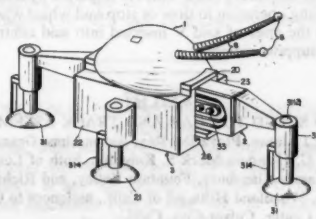
1. An electronic toy comprising: a support having a upper surface; a member adapted to be removably placed on the upper surface and to be supported thereby, said member having magnetic means thereon for creating a magnetic field adjacent to the upper surface when the member is supported thereby; an electronic circuit carried by the support and including an actuatable magnetically responsive device in the field of the magnetic means of the member when the member is on the upper surface, said circuit including a white noise generator having a signal, a speaker for generating sounds, and means coupling the white noise generator to the speaker so that the speaker can generate sounds corresponding to the output signals of the generator, said circuit further including oscillator means responsive to the actuation of the device for producing signals different from the output signals of the white noise generator, and means coupled with said oscillator means for mixing the output signals of the oscillator means and the generator to produce predetermined output sounds at the speaker.

4,333,259

WALL-CLAMBERING TOY SPACE BUG

Lin Pin-Huang, Taipei, Taiwan, assignor to Chen Te-Son, Taipei, Taiwan

Filed Nov. 13, 1980, Ser. No. 206,684
Int. Cl.³ A63H *11/04*
U.S. Cl. 46—132 **7 Claims**



1. A wall clambering toy comprising:

a longitudinal frame member having wall-attaching sucker means thereon at the opposite ends thereof;

a transverse frame member extending on opposite sides of said longitudinal frame member and having wall-attaching sucker means thereon at the laterally opposite ends thereof;

means mounting said members for reciprocal relative longitudinal movement therebetween accompanied by relative

vertical movement therebetween in an opposite direction at each end of said reciprocal longitudinal movement; and

power-operated means for effecting movements, whereby the sucker means on one member attach to a wall while the other member advances with its sucker means detached relative to the one member, the other member moves toward and attaches its sucker means to the wall, the one member moves away from and detaches its sucker means from the wall, advances and moves toward and attaches its sucker means to the wall, and the cycle is repeated.

4,333,260

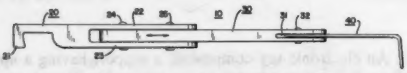
HOOP GUIDING AND BRAKING APPARATUS

Edward Hawkins, Sr., 117 Fisher Ave., Piscataway, N.J. 08854

Filed Apr. 13, 1981, Ser. No. 253,101

Int. Cl.[3] A63H *33/02*

U.S. Cl. 46—220 **8 Claims**



1. A roller hoop or wheel guide apparatus comprising:

an elongated member manifesting a support section, said member having a central slot at one end, and having at least one opening transverse to said central slot near the opposite end of said elongated member with said opening directed from the top surface to the bottom surface of said elongated member,

a handle section having a grip member adapted to be grasped by the hand of a user, first and second projecting members extending from said grip member to form a fork and separated one from the other to form a support accomodating space with one end of said support section inserted within said space with said opening underlying said projecting members,

a hoop engaging section comprising a loop having a top section in a plane parallel to said support section as directed from said support section manifested by two symmetrical sloping side arms forming a V configuration and thence directed relatively parallel to one another in the same plane, and then having an abrupt downward transverse bend in each arm at the end remote from said support section to form a cross bar between said arms for propelling a wheel emplaced between said side arms, with said V configuration operative to exert a braking force against the sides of said wheel as imparted by a user during a rolling operation to slow or stop said wheel when rolling with the apex of said V inserted into said central slot of said support member.

4,333,261

TWO SPEED TOY CAR AND TRACK ASSEMBLY

Lawrence T. Jones, Playa Del Rey; Anson Sims, Granada Hills; Ashley G. Howden; Mark S. Knighton, both of Los Angeles; L. C. James Kingsbury, Fountain Valley, and Richard F. M. Conroy, Woodland Hills, all of Calif., assignors to California R & D Center, Culver City, Calif.

Filed Jan. 22, 1980, Ser. No. 114,198

Int. Cl.[3] A63H *17/36*

U.S. Cl. 46—257 **18 Claims**

1. A miniature toy car having different forward driving gear ratios to provide at least two different forward speeds to the car comprising:

a car chassis body;

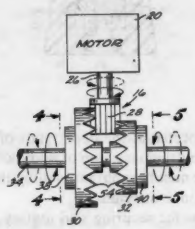
a reversible electric motor mounted to the car chassis body and having a rotating output shaft;

wheel means connected to the chassis body to permit movement of the toy car on a support surface, the wheel means including a pair of driving wheels interconnected by a rigid axle;

a first set of gears operatively connected to the output shaft of the motor and driven thereby;

a one-way clutch connecting the first set of gears to the axle to drive the axle and the driving wheels in a forwardly direction only as the output shaft is rotated in a first direction, the one-way clutch allowing the first set of gears to rotate independently of the rigid axle when the output shaft rotates in a second direction;

a second set of gears operatively connected to the output shaft of the motor and driven thereby, and



a second one-way clutch connecting the second set of gears to the axle to drive the axle and the driving wheels in a forwardly direction only as the output shaft is rotated in the second direction which is opposite to the first direction, the second one-way clutch allowing the first set of gears to rotate independently of the rigid axle when the output shaft rotates in the first direction, the first and second sets of gears having different gear ratios for driving the axle whereby the speed of forwardly driven rotation of the entire axle and of both rear wheels depends on the direction of rotation of the output shaft of the reversible electric motor.

4,333,262

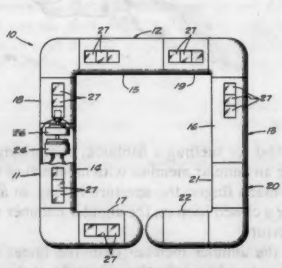
SOLAR POWERED TOY

Akira Kimura, 595 Broadway #2, New York, N.Y. 10012

Filed Nov. 3, 1980, Ser. No. 203,279

Int. Cl.[3] A63H *11/00, 33/26*

U.S. Cl. 46—266 **6 Claims**

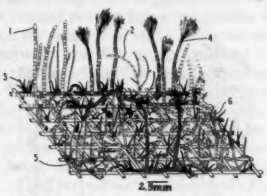


1. A solar powered toy including a plurality of legs each having a first section and an angularly related section, the legs being rotatably connected with adjacent legs, at least one of the legs having one section aligned with and pivotally connected to another section of an adjacent leg, means including an electric motor mounted in selected sections and each motor connected to turn the section of the adjacent leg, and solar cells mounted in an exposed position on at least one of said legs and connected to drive said electric motor.

4,333,263
ALGAL TURF SCRUBBER

Walter H. Adey, McLean, Va., assignor to The Smithsonian Institution, Washington, D.C.

Filed Oct. 7, 1980, Ser. No. 194,726
Int. Cl.³ A01G 7/00
U.S. Cl. 47—1.4 9 Claims



1. A method of producing an algal turf comprising the steps of:

providing spores of benthic microalgae,

providing a growing surface for spores of benthic microalgae,

subjecting the growing surface to light to grow a benthic algal turf on said surface,

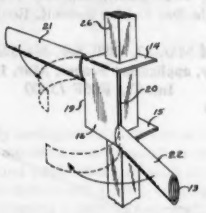
subjecting the benthic microalgae on the growing surface to water surge motion to promote metabolite cellular-ambient water exchange and control the light reception on the turf so that said turf receives substantially uniform illumination, and

periodically harvesting said benthic microalgae algal turf growing on said surface to remove a portion of the algae growing thereon prior to said turf being overgrown by macroalgae.

4,333,264
TREE NURSERY CLIP

Thomas J. Smrt, 172 S. Northwest Hwy., Cary, Ill. 60013

Filed Jan. 24, 1978, Ser. No. 871,829
Int. Cl.³ A01G 17/04, 9/12
U.S. Cl. 47—42 1 Claim

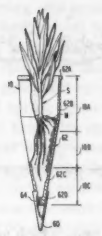


1. A tree nursery clip for training a tree to grow in a desired configuration comprising a generally C-shaped mounting portion having an upper planar attaching portion and a lower planar attaching portion connected by a generally planar bight portion, the attaching portions extending generally perpendicularly from the bight portion and being generally parallel to each other, each of the attaching portions having a non-circular opening for receiving a correspondingly shaped stake whereby the clip will not rotate relative to the stake, and a pair of bendable arms extending from the bight portion in generally opposite directions, the arms being constructed and arranged to be bent around a tree to hold the tree adjacent to the stake.

4,333,265
AIR DROP PLANTING SYSTEM AND IMPROVED PLANTING DEVICE FOR SAME

Richard L. Arnold, P.O. Box 3276, Reno, Nev. 89505

Filed Mar. 13, 1980, Ser. No. 129,925
Int. Cl.³ A01G 23/02
U.S. Cl. 47—74 5 Claims



1. An improved air drop planting device for air drop planting of seedlings or the like, said planting device comprising:

a hollow air foil body formed of a non-water soluble, soil bacteria biodegradable material,

said hollow body bearing internally a growing medium and a seedling within said medium and said seedling having its root structure within said medium and its leaf structure rising from the medium at an open end of said hollow body,

said body comprising at least one life support nutrient for said seedling, said body material comprising compressed ureaform powder, said body taking the shape of an open cone including in sequence from said open end, at least a major cone portion and an integral thickened tip, and wherein at least said tip being of increased density relative to said major cone portion, the outer surface of said compressed powder cone being roughened such that the hollow cone body is inherently aerodynamically stable so as to drop nose first to effect planting of said seedling by earth surface penetration, said planting device further comprising a driving wing assembly, said driving wing assembly including a circular band having an internal diameter on the order of said hollow cone body adjacent its open end, being concentrically mounted to said hollow cone body and bearing a plurality of air foil wings projecting radially from the periphery of the band for imparting rotation to said cone body and increasing the relative velocity of said planting device during air drop, and wherein the pitch of each air foil wing is approximately ten degrees, and said air foil wings are positioned thirty-one degrees to each side of a centerline bisecting said band.

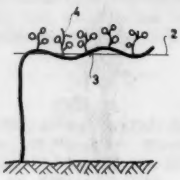
4,333,266
VITICULTURAL PROCESS AND VINE-DRESSING MACHINE

Tivadar Babo, Borkombinat, 6344 Hajos-Hild, Hungary

Continuation of Ser. No. 913, Dec. 27, 1978, abandoned, which is a continuation of Ser. No. 843,961, Oct. 20, 1977, abandoned.
This application Feb. 8, 1980, Ser. No. 119,820
Int. Cl.³ A01G 17/02
U.S. Cl. 47—58 6 Claims

1. In a viticulture process comprising growing a grape-vinestock having at least one cordon arm with (a) vine branches depending downwardly therefrom and (b) said cordon arm being supported by a functional wire strung between supporting posts, the improvement which comprises initially growing and training said cordon arm to be supported on a single functional wire, initially cultivating the downwardly depending vine branches to depend freely from said cordon arm and to be spaced about 10 to 30 cm apart and spray dressing the freely

downwardly depending vine branches and the growth thereon substantially downwardly from a predetermined level, said predetermined level being intermediate the upper and lower ends of said freely downwardly depending vine branches, for substantially preventing fruit growth in the sprayed areas, thereby causing regulation of high product yield and quality or



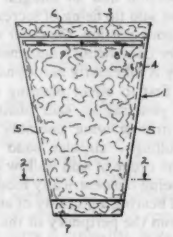
both, generally from the buds which are on the portion of the freely downwardly depending vine branches which are not subjected to said spray dressing, and thereby eliminating periodic cyclic product variations and permanently maintaining, without cutting, substantially the entire length of each freely downwardly depending vine branch.

4,333,267

PROTECTIVE SLEEVE FOR PLANTS

Earl R. Witte, Richfield, Wis., assignor to Meridian Industries Inc., Milwaukee, Wis.

Filed Apr. 28, 1980, Ser. No. 144,658
Int. Cl.³ A01G 9/02
U.S. Cl. 47—84 **5 Claims**



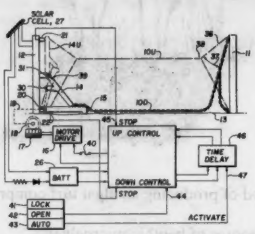
1. In combination, a pot to contain a plant and having a tapered body portion and a rim extending outwardly from the upper end of the body portion; and a protective open-ended sleeve surrounding the pot and the plant, said sleeve comprising a first sheet of material having a generally trapezoidal shape, a second sheet of material having a generally trapezoidal shape and disposed flatwise with respect to the first sheet, connecting means for joining the side edges of the sheets together to form a tapered sleeve to receive the plants, said sleeve having an open lower end and an open upper end, at least one of said sheets being formed of porous, spun bonded, randomly oriented synthetic fibrous material, each sheet having an upper edge and a lower edge and a pair of side edges that converge in a direction from the upper edge to the lower edge, the upper edge of a first of said sheets extending upwardly beyond the corresponding upper edge of the second sheet to provide a projecting end portion, said projecting end portion being foldable to enclose the open end of the sleeve and provide a complete enclosure for the plant, whereby the plant can be watered through the enclosed sleeve and air can circulate through the sleeve, the open lower end of said sleeve disposed in snug engagement with both the rim and the body portion of the pot.

4,333,268

ENERGY SAVING ELECTRICALLY ACTUATED BARRIER GATE CONTROL MEANS OPERABLE FROM SOLAR ENERGY

Robert F. Dumbeck, P.O. Box, Elgin, Tex. 78621

Filed Mar. 4, 1980, Ser. No. 127,233
Int. Cl.³ E01F 13/00
U.S. Cl. 49—34 **19 Claims**



1. A self powered environmental energy operated barrier access gate assembly, comprising in combination,

a gate assembly with a barrier movable into open and closed positions for prevention of automotive traffic therethrough in closed position,

a reversible d-c motor,

a gate actuating mechanism powered thereby comprising a motor driven gear coupled for pivoting a single pivotable lever arm connected to the gate assembly for thereby moving the gate barrier between said open and closed positions,

an electric control system actuating said motor for moving the gate to selected ones of said open and closed positions in respective forward and reverse motor directions,

a d-c battery power supply with an environmental energy producing device coupled to said power supply to recharge the battery, and

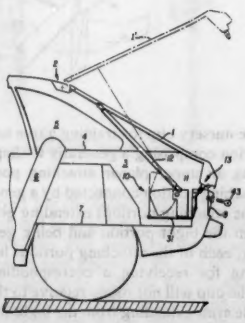
circuitry connecting said motor and control system to derive all operating power thereto from environmental energy by way of said rechargeable battery.

4,333,269

AUTOMATIC CONTROL AND LOCKING DEVICE

Jacques Bascou, Boulogne-Billancourt, France, assignor to Regie Nationale Des Usines Renault, Boulogne-Billancourt, France

Filed Mar. 17, 1980, Ser. No. 131,013
Claims priority, application France, Mar. 16, 1979, 79 06766
Int. Cl.³ E05F 15/00
U.S. Cl. 49—280 **6 Claims**



1. An apparatus for the remote control and locking of a

vehicle storage area hatch member having a lock, said apparatus comprising:

a plate mounted in said vehicle adjacent said hatch member;

an electric motor including an output pinion mounted on said plate;

an axis on said plate;

means for operating said hatch member, said means for operating comprising a first sector pivotally mounted on said axis and having a first cogged portion of a first length, said first cogged portion being engageable with said output pinion for rotation of said first sector, and a rod connected between said first sector and said hatch member whereby rotation of said first sector moves said hatch; and

means for locking and unlocking said hatch member, said means for locking and unlocking comprising a second sector pivotally mounted on said axis and having a second cogged portion of a second length, said second cogged portion being engageable with said output pinion for rotation of said second sector, said means for locking and unlocking further comprising mechanical means intermittently connecting said second sector and said lock whereby rotation of said second sector operates said lock; wherein said second length of said second cogged portion is greater than said first length of said first cogged portion whereby, beyond a predetermined angle of rotation, only said second sector is rotated by said pinion, and wherein said mechanical means includes:

a sheathed cable having one end connected to said lock and another end located adjacent said second sector;

a second pin on said second sector; and

a fork fixed to said other end of said cable at such a position relative to said second pin that said fork is engaged by said second pin beyond said predetermined angle of rotation of said second sector whereby the further rotation of said second sector operates said lock.

4,333,270

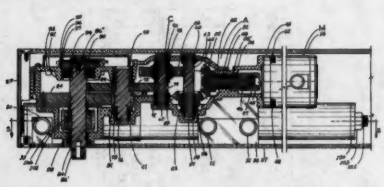
AUTOMATIC DOOR OPERATOR

John C. Catlett, Cordova, Tenn., assignor to BESAM-EADS, Inc., Memphis, Tenn.

Filed Feb. 22, 1980, Ser. No. 123,503

Int. Cl.³ E05F *15/12*

U.S. Cl. 49—336 **8 Claims**



1. A universally configurable door operator for driving any of various swing-mounted doors regardless of the directions of normal opening and panic swing of such door, said operator including a prime mover and a main housing and comprising within said main housing a door driving shaft, means mounting said door driving shaft for rotation about a vertical axis, said shaft being connectable to said door for closing and opening of said door by either clockwise or counterclockwise rotation of said door driving shaft, transmission means interconnecting said prime mover and said door driving shaft for producing rotation of said shaft in either a clockwise or counterclockwise direction for normal opening of said door pursuant to selective delivery of power by said prime mover, a pinion interconnected with said shaft for corresponding rotation with said shaft, and a rack gear meshing with said pinion for shifting movement in either of opposite directions about a longitudinal axis transverse to the rotational axis of said shaft in response to clockwise or counterclockwise rotation of said shaft, said main housing including an opening for access to one end of said rack gear, the improvement comprising a single changeable modular assembly including an assembly housing for selective attachment to said main housing and an operating rod within said assembly housing and including a portion extending through said opening into said main housing for selective interengagement with said one end of said rack gear, said assembly housing including a single coiled compression spring maintained therein in a state of pretension by said operating rod, said assembly housing orienting said spring for compression on an axis aligned with the longitudinal axis of transverse shifting movement of said rack gear, said spring having an inner end oriented toward said rack gear and an outer end oriented remote from said rack gear, said operating rod providing further tensioning of said spring by compression of said spring from said inner end or the outer end thereof in response to shifting of said rack gear in a predetermined direction corresponding to the direction of normal opening swing of said door for storing energy, said spring returning to its original state of pretension for transferring said stored energy to said rack gear via said operating rod to close said door upon cessation of delivery of power by said prime mover, and means within said assembly housing for limiting movement of said operating rod to establish the permissible extremes of shifting of said rack gear thereby to determine the permissible extremes of normal opening and panic swing of said door, said modular assembly being changeable for changing the normal opening and panic swing directions of said door.

4,333,271

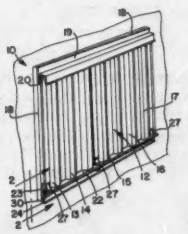
HURRICANE PANEL SECURITY DEVICE

James F. DePaolo, Coral Springs; Joseph T. Hale, Miami, and Carl F. Holmberg, Miami, all of Fla., assignors to Nichols-Homeshield, Inc., Aurora, Ill.

Filed Mar. 13, 1981, Ser. No. 243,470

Int. Cl.³ E06B *3/32*

U.S. Cl. 49—464 **7 Claims**

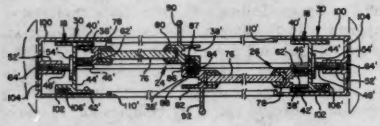


1. A hurricane panel installation having a header disposed adjacent the top of a building opening and a sill disposed adjacent the bottom of the opening, a hurricane panel extending into said header and supported on said sill, one or more fasteners extending vertically through a portion of the sill and engaging the hurricane panel above said portion and in contact with another part of the sill below said portion, a security member beneath said sill portion in engagement with said fasteners to prevent their removal, and a locking member extending through said sill portion and engaging the security member to lock the security member against displacement.

4,333,272
EXPANDABLE WINDOW DEVICE

Stephen B. Eastman, 5907 NE. 98th Ave., Vancouver, Wash. 98662

Filed Jun. 2, 1980, Ser. No. 155,576
Int. Cl.³ E06B 1/04
U.S. Cl. 49—505 5 Claims



1. An expandable window device adaptable for various size casings, said window device comprising:

a plurality of track members including a sill track member, a header track member and jamb track members joined to form a track frame into which a window sash is slidably received,

at least one U-shaped horizontal expander channel receiving therewithin a horizontally disposed track member, and at least one U-shaped vertical expander channel receiving therewithin a vertically disposed jamb track member,

and expanding means extending from ones of said track members and engaging ones of said expander channels for urging said expander channels toward the inside of the casing into which the window is to be located,

wherein said expanding means comprise plural threaded fasteners rotatable from within said track frame and threadably engaging said ones of said expander channels for adjustably urging the same toward the inside of the casing,

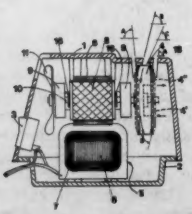
ones of said track members being substantially H-shaped in cross section having side flanges over which said expander channels are slidable and a web between said side flanges for receiving a said threaded fastener, a said threaded fastener extending for making a threaded connection with a rib at the end of a said expander channel,

wherein a said H-shaped track member is provided with a central longitudinal track partition toward said window sash for forming a double track adaptable for receiving either one of a pair of window sashes, said central longitudinal partition having breaks at locations of said threaded fasteners, each of said fasteners comprising a flathead screw having a driving head received in a countersunk hole in the web of a said track member and accessible from within the said track member.

4,333,273
ELECTRIC KNIFE SHARPENER

Gilles Roucau, 11667 St-Julien, Montreal-North, Prov. of Quebec, Canada (H1H 3Y9), and Emilien Roussy, 2259 Desormeaux, St., Montreal, Prov. of Quebec, Canada (H1L 4X2)

Filed May 23, 1980, Ser. No. 152,701
Int. Cl.³ B24B 3/54
U.S. Cl. 51—102 5 Claims

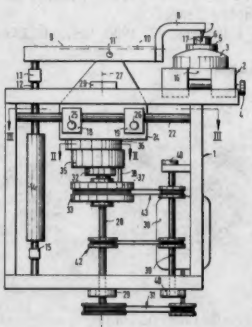


1. An electric knife sharpener comprising a housing, an electric motor mounted in said housing and including a rotor and a stator, bearing means rotatively holding the rotor and arranged for axial displacement of the latter, said rotor having an armature rotatively carried by said bearing means and axially displaceable relative thereto, the stator having a winding producing a magnetic field operatively acting on the armature to drive the rotor and axially biasing the armature against axial displacement thereof from a magnetically neutral axial position relative to said bearing means, a grinding wheel connected to the rotor and axially displaceable bodily therewith against the magnetic axial bias produced on the rotor by the winding, and said housing havinhg at least one aperture therein adjacent the grinding wheel and providing access to hold a knife in lateral contact with one side of the grinding wheel against said magnetic axial bias for operative sharpening of the knife.

4,333,274
MACHINE FOR SMOOTHING AND/OR POLISHING LENS FACES

Stuart Eadon-Allen, Birmingham, England, assignor to Dollond & Aitchison Services Limited, Birmingham, England

PCT No. PCT/GB78/00039, § 371 Date Jul. 11, 1979, § 102(e) Date Jul. 11, 1979, PCT Pub. No. WO79/00285, PCT Pub. Date May 31, 1979
PCT Filed Nov. 13, 1978, Ser. No. 127,243
Int. Cl.³ B24B 13/00
U.S. Cl. 51—160 10 Claims



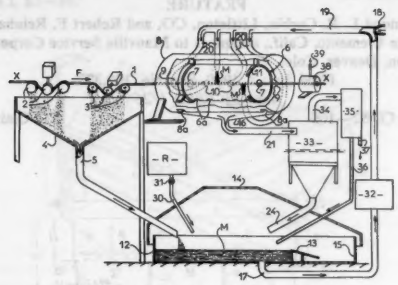
1. A machine for smoothing and/or polishing lenses comprising at least one pair of relatively movable holders arranged for holding respective ones of a tool and a workpiece which are to be rubbed together by relative movement of the holders, constraining means for maintaining respective reference axes of the holders parallel to a reference plane and driving means for causing said relative movement of the holders characterised in that the driving means comprises first and second elements which are rotatable about a main axis at respective different speeds, the first element defining an auxiliary axis offset from the main axis to move around the main axis when the first element rotates and an output element mounted for rotation about the auxiliary axis, the second element being so associated with the output element as to move the output element around the auxiliary axis when the second element moves around the main axis.

4,333,275

PROCESS AND APPARATUS FOR DESCALING ROD

Jean Bernot, Saint Dizier, France, assignor to Trefilunion S.A., Saint Dizier, France

Filed Jun. 13, 1979, Ser. No. 48,114
Claims priority, application France, Jun. 20, 1978, 78 18654
The portion of the term of this patent subsequent to Nov. 27, 1996, has been disclaimed.
Int. Cl.³ B24C *1/00, 3/12*
U.S. Cl. 51—320 16 Claims



1. A process for removing iron oxide scale from a steel rod, including the steps of bending the rod to cause a portion of said scale to be detached from the rod surface, collecting the detached scale, projecting the collected scale against the rod within an enclosure at a point downstream from the bending site, re-collecting the projected and newly detached scale, and recycling the re-collected scale for further projecting, characterized by:

(a) suspending the collected, projected, re-collected and recycled scale in a liquid carrier,

(b) accelerating the projected suspended scale against the rod with pressurized air,

(c) projecting the accelerated suspended scale against the rod at a plurality of axially spaced points relative to the longitudinal dimension of the rod, and

(d) elastically cushioning the interior surface of the enclosure.

4,333,276

TUMBLING APPARATUS

James R. Goff, Rte. 1 - Box 247AB, Seminole, Okla. 74868

Filed Mar. 26, 1980, Ser. No. 134,245
Int. Cl.³ B24C *3/26*
U.S. Cl. 51—422 9 Claims

1. A tumbling apparatus for tumbling workpieces comprising:

a frame,

a first roller rotatably mounted in said frame,

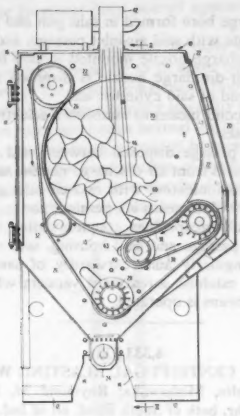
a second roller spaced from said first roller and rotatably mounted in said frame,

a first endless belt mounted circumferentially around said first and second rollers thereby defining an outer surface of said first belt and defining an upwardly opening pocket on the outer surface of said first belt for receiving said workpieces,

means for driving said first belt,

a third roller spaced from said first and second rollers rotatably mounted in said frame and located below said pocket,

a second endless belt mounted circumferentially around said second and third rollers and located within said first endless belt so that said second belt is in supporting contact with said first belt underneath a portion of said pocket.

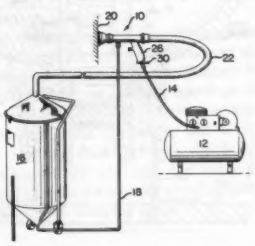


4,333,277

COMBINATION SAND-BLASTING AND VACUUM APPARATUS

Robert T. Tasedan, 562 Joann, A, Costa Mesa, Calif. 92627

Filed Jul. 28, 1980, Ser. No. 172,776
Int. Cl.³ B24C *3/02*
U.S. Cl. 51—425 6 Claims



1. A sand-blasting apparatus, including a compressor and a storage tank, comprising:

a sand-blasting gun having an air-inlet passage and a sand-inlet passage, and including a longitudinal cylindrical housing provided with front and rear open ends;

a first means in said gun to provide a continuous rearward air flow to establish a continuous vacuum in a rearward direction through said cylindrical housing;

a second means in said gun to provide a selective rear air flow to establish a secondary selective vacuum in a rearward direction through said cylindrical housing;

a trigger-valve means to control air flow to said secondary vacuum means, and interposed between said secondary vacuum means and said air-inlet passage;

an air-and-sand-mixing-vacuum chamber;

a front air-discharge nozzle positioned within said air-and-sand-mixing-vacuum chamber;

a sand-discharge nozzle attached to said gun, and projecting from said front open end of said housing; and

means to enclose said sand-discharge nozzle to confine the sand between said gun and the surface of the workpiece

being sanded, whereby sand in said enclosure is vacuumed therefrom;

wherein said first means to establish a continuous vacuum comprises:

a rear discharge bore formed in said gun and positioned to communicate with said air-inlet passage; and

a rear air-discharge nozzle mounted in said bore, wherein said rear air-discharge nozzle is disposed adjacent said rear open end of said cylinder; and

wherein said second means to establish a selective secondary vacuum comprises:

a second air passage disposed between said trigger-valve means and said front air-discharge nozzle, said second air passage communicating with said air-inlet passage when said trigger-valve means is operated; and

a pair of discharge orifices communicating between said second air passage and said housing, said orifices being disposed angularly and rearwardly of said second air passage, to establish a rearward vacuum when said trigger-valve means is operated.

4,333,278

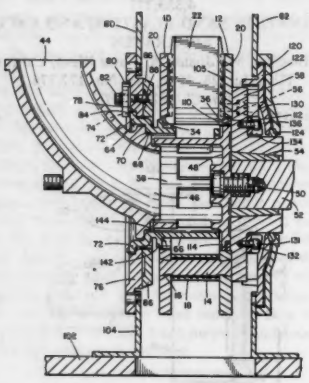
BLADED CENTRIFUGAL BLASTING WHEEL

Harold F. Schulte, Mishawaka; Raymond M. Leliaert, and Robert D. Rohr, both of South Bend, all of Ind., assignors to Wheelabrator-Frye Inc., Hampton, N.H.

Filed Sep. 24, 1979, Ser. No. 78,478

Int. Cl.³ B24C *5/06*

U.S. Cl. 51—434 **10 Claims**



1. In a bladed centrifugal blasting wheel, a pair of front and back wheel plates interconnected in spaced parallel relation with each wheel plate having a central opening defined by inner peripheral surfaces of the wheel plates, a plurality of crosswise aligned grooves in the inner faces of said front and back wheel plates extending radially in equally circumferentially spaced apart relation from the inner peripheral surfaces of the wheel plates to their outer edges, a blade for each pair of aligned grooves dimensioned to have a width slidably to be received between said pair of crosswise aligned grooves and dimensioned to have a length to enable insertion into said crosswise aligned grooves through said central opening, means releasably holding the blades within said crosswise aligned grooves when in position of use between said front and back wheel plates, said means comprising lugs extending laterally from the opposite sides of the inner end portion of the blade for a distance to extend beyond the inner ends of the grooves whereby the inner peripheral surface of the plates, adjacent the grooves, lies in the path of the lugs to prevent displacement of the blade beyond engagement between the lugs and the plates when the blades are inserted in position of use, an impeller in the form of a vaned cylindrical member mounted within the central opening, flange means extending radially outwardly from the impeller for a distance less than the central opening but more than the distance between the central opening less the length of the blade lugs, and slots in the outer ends of said flange means dimensioned to receive portions of said blade lugs extending inwardly beyond the inner ends of the grooves to interlock the impeller and the blades to maintain registry therebetween.

4,333,279

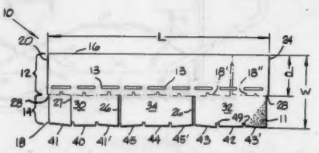
THREE-TAB SHINGLE WITH STAGGERED BUTT EDGE FEATURE

Raymond L. R. Corbin, Littleton, CO, and Robert F. Reinhart, San Clemente, Calif., assignors to Manville Service Corporation, Denver, Colo.

Filed Jan. 3, 1980, Ser. No. 109,377

Int. Cl.³ E04D *1/26*

U.S. Cl. 52—105 **12 Claims**



1. In a shingle of generally rectangular planar shape having a headlap portion and a butt portion, said rectangular shape being defined by a top edge at the upper edge of the headlap portion, a butt edge on the lower edge of said butt portion, a leading edge and a trailing edge each extending between said top edge and said butt edge;

at least one slot cutout having a length which extends from said butt edge across said butt portion towards said headlap portion and terminating a predetermined distance from said top edge;

means located on at least said trailing edge for indicating said predetermined distance;

a first tab extending longitudinally between said leading edge and said at least one slot cutout;

a second tab extending longitudinally between said at least one slot cutout and said trailing edge;

said first tab and said second tab being substantially the same length and each tab having a lower edge corresponding to a portion of said butt edge;

an alignment edge extending a minor portion of the length of said lower edge of each said first tab and said second tab for aligning with the terminal end of a slot cutout or an indicating means of a substantially identical subjacent shingle, said alignment edge being generally straight, parallel, and spaced the same distance away from said top edge of the shingle;

the lower edge of said first tab and the lower edge of said second tab each including a first staggered edge and a second staggered edge, said staggered edges flanking said alignment edge, said staggered edges being angled relative to said top edge and relative to said alignment edge, said staggered edges together with said alignment edges operating to give said butt edge a jagged, nonuniform appearance, the improvement comprising:

(a) said first staggered edge of said first tab is adjacent said leading edge and said second staggered edge of said second tab is adjacent said trailing edge, said first and second staggered edges having substantially identical contours and spaced substantially equal distances from said top edge, and

(b) a knife slit located between said first staggered edge and said alignment edge of said first tab, said knife slit extending substantially across said butt portion.

4,333,280

SHEAR LOAD RESISTANT STRUCTURE

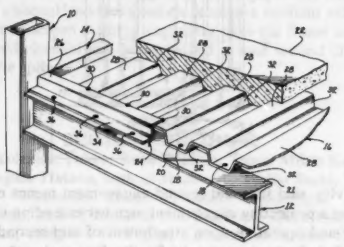
Virgil R. Morton, Redondo Beach, Calif., assignor to Verco Manufacturing, Inc., Phoenix, Ariz.

Division of Ser. No. 86,271, Oct. 19, 1979, Pat. No. 4,335,557, which is a continuation-in-part of Ser. No. 936,176, Aug. 23, 1978, Pat. No. 4,186,535. This application Nov. 24, 1980, Ser. No. 209,874

The portion of the term of this patent subsequent to Feb. 5, 1997, has been disclaimed.

Int. Cl.[3] E04B *1/98*

U.S. Cl. 52—167 34 Claims



1. A diaphragm for translating horizontal shear loads imposed thereon through a supporting load bearing member to vertical load resisting members in buildings, said diaphragm comprising in combination:

(a) a fluted deck, said fluted deck including webs alternately interconnecting top and bottom flutes terminating at opposed open ends defined by the extremities of said webs, said top flutes and said bottom flutes, said fluted deck having each of the opposed open ends supported by a load bearing member;

(b) first attachment means for rigidly securing selected ones of said bottom flutes to the supporting load bearing member;

(c) load translation means transversely located with respect to the flutes of said fluted deck for interconnecting selected ones of the open ends defined by said top flutes and adjacent ones of said webs with the load bearing member;

(d) second attachment means for rigidly securing at least one of said webs and the interconnecting one of said top flutes of the selected ones of the open ends directly to said load translation means; and

(e) third attachment means for rigidly securing said load translation means with the load bearing member;

whereby, said load translation means inhibits relative movement between said top and bottom flutes and buckling said webs of said fluted deck due to horizontal shear loads imposed upon said diaphragm and said load translation means translates the horizontal shear loads from said diaphragm to the load bearing member and ultimately to the vertical load resisting members.

4,333,281

BASEMENT WALL DRAINING MOLDING

Santo Scarfone, Windsor, Canada, assignor to Scarfone Construction Limited, Windsor, Canada

Filed Mar. 10, 1980, Ser. No. 128,523

Claims priority, application Canada, Feb. 14, 1980, 348689

Int. Cl.[3] E04B *1/70;* E02D *31/02*

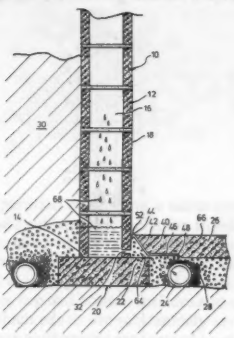
U.S. Cl. 52—169.5 9 Claims

1. A basement wall drain unit for removing moisture from a wall formed of concrete blocks to have a base, an interior, and an inner surface, the blocks being laid on a footing with a weeping drain extending beneath a concrete basement floor having an upper surface and along a portion of the footing which extends inwardly past the inner surface of the wall, a plurality of horizontally spaced drain passages having been formed to extend from the interior of the wall to the inner surface of the wall near the base of the wall, the drain unit comprising an elongated sheet-like integral body having a substantially uniform cross section to extend adjacent the base of the wall generally above the inner portion of the footing with the concrete basement floor poured against it, the body having:

(a) a first wing portion spaced from the inner surface of the wall and extending upwardly to an upper edge above the upper surface of the concrete basement floor; and

(b) a second wing portion extending inwardly from the first wing portion to an inner edge beyond the inner portion of the footing, spacing being provided between the second wing portion and the inner portion of the footing;

whereby a space is formed between the drain unit and the inner surface of the wall and the inner portion of the



footing into which moisture may drain from the interior of the wall through the drain passages and then down into an area beneath the basement floor adjacent the weeping drain,

said body further having:

(c) a lip portion sloping downwardly and outwardly from the upper edge of the first wing portion to abut against the inner surface of the wall, the lip portion having spaced indentations therealong to form openings between it and the inner surface of the wall, whereby moisture may drain down from the inner surface of the wall, through the openings into said space between the drain unit and the inner surface of the wall and the inner portion of the footing and then down into the area beneath the basement floor adjacent the weeping drain.

4,333,282

MULTI-LAYERED BULLETPROOF WINDOW

Richard C. Medlin, 2434 Toftrees, San Antonio, Tex. 78209

Continuation-in-part of Ser. No. 920,715, Jun. 30, 1978, Pat. No. 4,316,404. This application May 5, 1980, Ser. No. 146,300

Int. Cl.[3] E06B *7/12, 3/24*

U.S. Cl. 52—172 8 Claims

1. A protective window comprising:

a first section of translucent material and a second section of translucent material, and first section and said second section being separated by a space, and said first section and said second section being composed and constructed to resist penetration by high velocity projectiles;

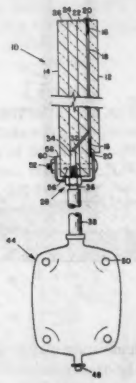
a coupling located between said first section and said second section, the combination of said coupling, said first section, and said second section enclosing said space and preventing substantial gaseous communication between said enclosed space and atmosphere;

a low pressure gaseous drying agent within said enclosed space, said gaseous drying agent being pressurized more than one atmosphere;

means for maintaining pressure of said gaseous drying agent at more than one atmosphere, said gas maintaining means operating by supplying additional gaseous drying agent via passage means to within said enclosed space as may be necessary to maintain pressure of said gaseous drying agent at more than one atmosphere, said means for maintaining including;

at least one window aperture, said window aperture being a means of gaseous communication between said enclosed space and a gaseous drying agent reservoir; and

a combination comprising said enclosed space, said window aperture, said passage means, and said gaseous drying agent reservoir, said combination being constructed and designed so that upon loss of said gaseous drying agent from within said enclosed space, additional quantities of said gaseous drying agent are communicated from said gaseous drying agent reservoir to



within said enclosed space as to at least partially offset said loss of said gaseous drying agent from within said enclosed space and thereby maintain a gas pressure of more than one atmosphere within said enclosed space;

said gaseous drying agent reservoir being substantially impermeable to gaseous diffusion and capable of containing said gaseous drying agent at more than one atmosphere for extended periods of time without undue leakage, said gaseous drying agent reservoir being designed and constructed to exert a continuous positive pressure upon said gaseous drying agent such that some of said gaseous drying agent is communicated from said gaseous drying agent reservoir to said enclosed space, said gaseous drying agent reservoir continuing to exert positive pressure upon said gaseous drying agent remaining within said gaseous drying agent reservoir; and

said gaseous drying agent reservoir including an elastic collapsible bag.

4,333,283

DOUBLE SASH STRUCTURE

Hiroyuki Ebata, Uozu, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

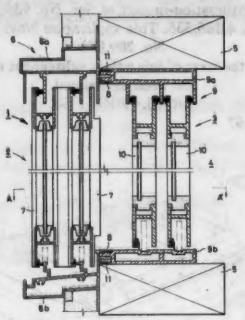
Continuation of Ser. No. 863,581, Dec. 22, 1977, abandoned. This application Oct. 30, 1979, Ser. No. 89,310

Claims priority, application Japan, Dec. 29, 1976, 51/178687[U]

Int. Cl.³ E06B *3/26, 1/32, 1/26*

U.S. Cl. 52—202 **6 Claims**

1. A double sash structure for attachment in and around an opening in a room structure, a first window frame supporting said first sash and having first engagement means integral therewith, a second sash disposed on the indoor side of the room structure, and a second window frame supporting said second sash and having second engagement means integral therewith adapted for positive coupling with said first window frame, said first window frame and said first sash being formed of a metallic material and said second window frame and second sash a synthetic resin material having a low heat con-



ductivity, said first and second engagement means each comprising a projecting engagement member extending toward the other and operative upon attachment of said second frame to said first frame to securely fix the first and second frames together.

4,333,284

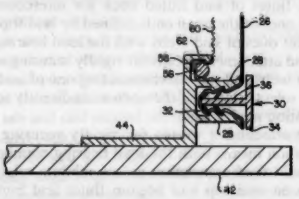
EXTRUSION AND BUILDING STRUCTURES

David F. Meadows, Milton, W. Va., assignor to DoNel Corporation, Mt. Vernon, Ohio

Continuation-in-part of Ser. No. 1,593, Jan. 8, 1979, Pat. No. 4,233,790, which is a continuation-in-part of Ser. No. 807,492, Jun. 17, 1977, abandoned. This application Jun. 9, 1980, Ser. No. 157,863

Int. Cl.³ E04B *1/00*

U.S. Cl. 52—222 **10 Claims**



1. A window-like structure comprising:

a plurality of rigid side and end members secured together in perpendicular and parallel relationship to form a frame and arranged to be secured to a building structure, the ends of said members being mitered and united together, each of said members of said frame being formed with a first channel which combine to form a continuous channel positioned around the periphery of said frame, said channel including teeth projecting inwardly from its sides;

a sheet of flexible plastic material spreading over all of said side and end members;

a plurality of locking members being inserted in said continuous channel, thereby forcing a portion of said flexible plastic sheet into said channel and stretching, sealing, holding, and locking said sheet to said frame in said channel;

each said locking member being formed as a one piece extrusion having a generally T-shape in cross section with a stem and a head both of which are formed of substantially rigid plastic material and which has both sides of the stem

of the T provided with integral spaced angularly and outwardly extending projections of plastic material substantially more flexible than the substantially rigid material of the main section of the T and integrally united with the substantially rigid material of the main section of the T, said projections having a thickness less than the stem and being inclined from the stem toward the head;

the width of the channel between the crests of the teeth being less than the width between the outer ends of the projections, the teeth and projections combining to lock the sheet in place, the improvement comprising:

means forming a second channel in the side and end members, said second channel being spaced inwardly from the first channel and designed to receive a resilient spline, a sheet of screen material extending over the frame and the second channel and being locked in said second channel by the spline.

4,333,285

BUILDING STRUCTURE

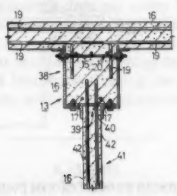
Hajime Koizumi, Tokyo; Kozo Toyama, Tama; Mikio Kobayashi; Hajime Hatano, both of Hachiooji; Toshio Saeki, Tama; Kaoru Mizukoshi, Hino; Shinichi Tamanaga; Keizo Miyakawa, both of Kodaira, and Tomoyasu Kato, Tokyo, all of Japan, assignors to Kajima Kensetsu Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 858,198, Dec. 7, 1977, Pat. No. 4,211,045. This application Aug. 8, 1979, Ser. No. 64,732

Claims priority, application Japan, Jan. 20, 1977, 52-5198; Mar. 17, 1977, 52-30112; May 24, 1977, 52-66452; May 24, 1977, 52-66453; May 24, 1977, 52-66454

Int. Cl.³ E04B 5/36

U.S. Cl. 52—252 **3 Claims**



1. A building structure comprising: columns and a concrete pour of a wall, slab and beams, including

(a) a steel reinforcing channel comprised of a pair of opposed horizontally extending side wall members having bottom and top openings therebetween communicating with the space between said members, the contour of said steel channel being in conformity with that of a concrete beam to be formed, and said side wall members being confined between adjoining columns;

(b) said bottom and top openings extending continuously along the entire longitudinal extent of said side wall members;

(c) horizontal steel interconnecting members transversely spanning and interconnecting the lower edges of said opposed side wall members, said interconnecting members being spaced apart so as not to appreciably diminish the area of said bottom opening;

(d) reinforcing rods extending from said wall into the space between said opposed side wall members through said bottom opening;

(e) reinforcing rods extending from said slab into the space between said opposed side wall members through said top opening, and

(f) interconnecting concrete forming said slab and filling said channel and said wall through said top and bottom openings to form a concrete beam atop and coextensive with said wall and integrated therewith throughout the entire length of the beam.

4,333,286

WALLS AND PARTITIONS AND CONCEALED FASTENERS FOR ASSEMBLY THEREOF

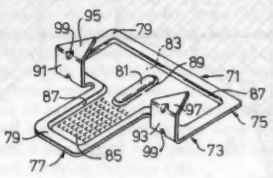
Roger N. Weinar, 19 Parkside Ave., Hamburg, N.Y. 14075

Continuation-in-part of Ser. No. 947,078, Sep. 29, 1978, Pat. No. 4,221,095, and Ser. No. 171,331, Jul. 23, 1980, Pat. No. 4,296,580, which is a continuation-in-part of Ser. No. 736,425, Oct. 28, 1976, Pat. No. 4,117,644. This application Sep. 8, 1980, Ser. No. 184,961

The portion of the term of this patent subsequent to Oct. 3, 1995, has been disclaimed.

Int. Cl.³ E04B 1/00

U.S. Cl. 52—281 **39 Claims**



1. A wall or partition comprising a substructure and a surface structure, said substructure including framing or supporting means for holding the surface structure, and said surface structure comprising first and second aligned substantially flat panels, adjacent at sides thereof, each of which has concealed major back, sides, top and bottom surfaces and a visible major front surface, which panels are substantially invisibly secured to the substructure and thereby are secured together or spaced apart a spacing distance by a first series of spaced apart concealed fastener clips appended to said first panel and to the substructure, and a second series of spaced apart concealed fastener clips appended to said second panel, so located as to avoid contact with any of said first series clips, and with a part of each of the panel contacting surfaces of each of the second series of clips contacting the major back surface of the first panel and spacing such surface from the framing or supporting means, with each of the clips of both said series being made from sheet or strip material and having spacing base portions, each of which is substantially coplanar and directly continuous, extending substantially parallel to said respective panels at concealed major back surfaces of said panels, with said spacing base portions each having, spaced apart, a substructure contacting surface on one side of the material thereof and a panel contacting surface on the other side, which spacing base portions space the major back panel surface from the framing or supporting means, which clip surfaces are spaced apart by intermediate strengthening wall(s), a plurality of web portions extending from each of said base portions and between the ajdacent first and second panel sides, and pointed tabs extending from said web portions, impaling a side of the panel to which the clip is appended, and wherein the clip fasteners of the second series of clips include reinforcing and lateral movement inhibiting indentations in web portions thereof.

4,333,287

SYSTEM OF LATTICE TILES

Marlan M. Lewis, 6036 Ridgecrest, Dallas, Tex. 75231, assignor to Marlan M. Lewis, Dallas, Tex.

Continuation of Ser. No. 930,377, Aug. 2, 1978, abandoned. This application May 29, 1980, Ser. No. 154,585

Int. Cl.³ B44F 7/00

U.S. Cl. 52—311 **2 Claims**

1. A system of lattice tiles for constructing a decorative lattice, comprising:

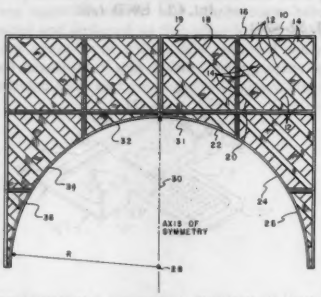
a first tile which includes:

a first plurality of strips,

a second plurality of strips attached across said first strips to

form a square section of lattice with said strips disposed symmetrically with respect to the diagonals of the square so that a plurality of said tiles may be joined together with the strips of one tile appearing to be continuations of strips in adjacent tiles; and,

second, third, and fourth tiles, each comprising a portion of a square section formed by said first tile, said portions being shaped to form one half of an arch when said third tile is installed adjacent to said second tile and when said fourth tile is installed adjacent said third tile,



each of said tiles including a border strip around the tile and the border strip of said first tile being adapted to abut against and along an identical border strip of another tile, and at least two sides of the border strips of said second, third, and fourth tiles adapted to abut against and along an identical border strip on another tile,

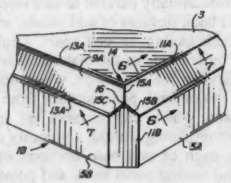
whereby a plurality of said tiles can be installed to form an archway.

4,333,288

BEVELED EDGE TRIM

Donald W. Coombs, 8191 E. Helen St., Tucson, Ariz. 85715

Filed Oct. 3, 1979, Ser. No. 81,478
Int. Cl.³ B32B *3/02*
U.S. Cl. 52—312 **6 Claims**



1. A countertop structure comprising in combination:

a. a substrate, said substrate having a horizontal flat upper surface and a substantially vertical edge surface;

b. a first laminate layer adhesively attached to the upper surface of said substrate;

c. a second laminate layer adhesively attached to the substantially vertical surface of said substrate;

d. a first beveled inlay groove in said countertop structure, the bottom surface of said beveled inlay groove being of uniform width, said first beveled inlay groove being disposed between adjacent edges of said first and second laminate layers, said first beveled inlay groove having two opposed side walls at least partially formed by said adjacent edges of said first and second laminate layers, said side walls of said first beveled inlay groove each being sloped outward from the bottom surface of said first beveled inlay groove so that the width of the top portion of said first beveled inlay groove is greater than the width of the bottom surface thereof;

e. a first inlay strip disposed in and substantially coextensive with said first beveled inlay groove, said first inlay strip having a thickness substantially equal to the depth of said first beveled inlay groove, said first beveled inlay strip having two opposed side walls and an inner surface and outer surface, said side walls of said first beveled inlay strip each being sloped so that the width of the outer surface of said first inlay strip is substantially equal to the width of the top portion of said first beveled inlay groove and the width of the inner surface of said first inlay strip is substantially equal to the width of the bottom surface of said first beveled inlay groove, so that the side walls of said first inlay strip closely adjoin the two side walls of said first beveled inlay grooves, respectively; and

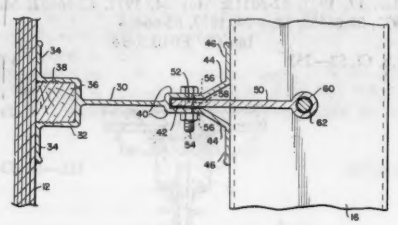
f. adhesive means disposed between said first beveled inlay groove and said first inlay strip.

4,333,289

CONCRETE FORM SUPPORT STRUCTURE

James K. Strickland, Jacksonville, Fla., assignor to Strickland Systems, Inc., Jacksonville, Fla.

Filed Feb. 29, 1980, Ser. No. 125,939
Int. Cl.³ B24B *45/00*
U.S. Cl. 52—364 **2 Claims**



1. Apparatus for use in concrete form panel support comprising:

an elongate beam having a generally uniform I-shaped cross section with an outwardly opening pocket extending along one edge thereof to retain a nailer for securing said beam to a form panel and a Y-shaped segment extending along the opposite edge of said beam, said segment being formed by legs having one length thereof parallel to define therebetween an outwardly opening cavity and a second length of said legs diverging outwardly from said first length, said legs having oppositely directed flanges extending from the outer ends of the diverging second length of said legs;

a bracket having a flat portion insertable into said cavity and means functioning as a fastening tubular portion connected to said flat portion, said tubular portion accommodating a fastening element therewithin to fasten said bracket and the elongate beam carried thereby to a stiffener member of the form panel support structure;

means enabling said flat portion of said bracket to be secured in said cavity of the beam Y-shaped segment at a predetermined position along the length of said beam;

a fastening element received within said tubular portion of said bracket; and

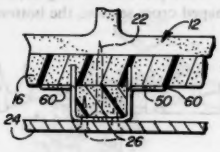
a stiffener member engaged by said fastening element formed by strong back elements that are each engaged by said fastening element with said strong back elements being spaced by the length of said tubular portion of said bracket therebetween.

4,333,290

STRUCTURAL MEMBER FOR INSTALLATION SYSTEM

Michael V. Koberstein, Scottsdale, Ariz., assignor to Arizona Diversified Products, Inc., Phoenix, Ariz.

Filed May 10, 1979, Ser. No. 37,539
Int. Cl.³ E04B 1/88, 2/28
U.S. Cl. 52—376 5 Claims



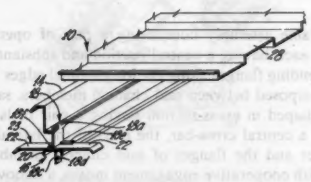
1. An insulation system comprising:
(a) a masonary wall;
(b) at least one cellular insulation sheet at the surface of said wall;
(c) an elongate generally U-shaped metal strip substantially co-extensive with a dimension of said insulation sheet, said strip having a bight section and at least one depending leg;
(d) insulative spacer means integrally formed with said strip adapted to elevate the bight section of said strip from the face of said insulation sheet;
(e) first fastener means extending through said metal strip into said wall securing said strip against said sheet with said spacer engaging said sheet and said bight portion at said strip elevated from the surface of said sheet;
(f) a finishing panel engaging the bight of said strip; and
(g) second fastener means securing said finishing panel to said metal strip with a dead air space therebetween, said dead air space being established between said finishing panel and said insulation sheet by said spacer means elevating the bight section of said strip from the face of said insulation sheet thereby increasing the overall R value of the wall system without the requirement of additional insulation.

4,333,291

INSULATED ROOF STRUCTURE

Dwight S. Musgrave, Granville; John D. McMahan, Newark, and Robert L. Downing, S. Vienna, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jul. 28, 1980, Ser. No. 172,876
Int. Cl.³ E04B 1/74
U.S. Cl. 52—404 2 Claims



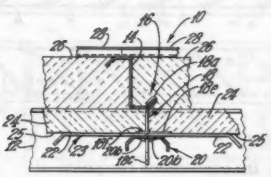
1. An insulated roof structure (10) comprising a plurality of parallel horizontally extending beams (12) spaced apart from each other, a plurality of parallel horizontally extending purlins (14) spaced apart from each other, supported by and extending transversely of the beams (12), and each having a generally Z-shaped cross section with an upwardly extending lower free end portion, a plurality of insulation support members (16), each of said purlins (14) having a plurality of said insulation support members (16) hung thereon and extending longitudinally therealong in a row, each insulation support member (16) including a pair of spaced hangers (18) respectively having hooked upper end portions (18*a*) in which an upwardly extending lower free end portion of a purlin (14) is received, an elongated board-edge sealing member (20) of inverted generally channel-shaped cross section, and two pairs of horizontally extending guide and support arms (22) extending transversely of the sealing member (20), the hangers (18) respectively supporting opposite end portions of the sealing member (20) and each hanger (18) having a pair of the guide and support arms (22) extending respectively oppositely therefrom, a plurality of fibrous glass boards (24) providing an inner roof layer, each board (24) extending between a pair of adjacent purlins (14) and a row of the boards (24) extending along the adjacent purlins (14) between each pair of adjacent beams (12), each board (24) being provided with an impervious facing (25) and being supported adjacent one end on the board-edge sealing member (20) and the respective arms (22) of an insulation support member (16) on one purlin (14) of a pair of adjacent purlins (14) and being supported adjacent the other end of the board-edge sealing member (20) and the respective arms (22) of an insulation support member (16) on the other purlin (14) of the pair of adjacent purlins (14), a plurality of fibrous glass insulation batts (26) covering the inner roof layer of boards (24), and a plurality of roof panels (28) secured to the purlins (14) and covering the batts (26).

4,333,292

INSULATED ROOF STRUCTURE

Dwight S. Musgrave, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jul. 28, 1980, Ser. No. 172,877
Int. Cl.³ E04B 1/74
U.S. Cl. 52—404 7 Claims



1. An insulated roof structure (10) comprising a plurality of parallel horizontally extending beams (12) spaced apart from each other, a plurality of parallel horizontally extending purlins (14) spaced apart from each other, supported by and extending transversely of the beams (12), and each having a generally Z-shaped cross section with an upwardly extending lower free end portion, a plurality of insulation support members (16), each of said purlins (14) having a plurality of said insulation support members (16) hung thereon and extending longitudinally therealong in a row, each insulation support member (16) including a pair of spaced hangers (18) respectively having hooked upper end portions (18*a*) in which an upwardly extending lower free end portion of a purlin (14) is received, an elongated board-edge sealing member (20) of inverted generally channel-shaped cross section, and a pair of crosspieces (23) extending transversely of the sealing member (20), each hanger (18) including a lower tab portion (18*c*) and a pair of offset transversely oppositely extending intermediate tabs (18*e*, 18*f*), each crosspiece (23) having an aperture (23*a*), the board-edge sealing member (20) being provided respectively adjacent opposite ends with a pair of rectangular apertures (20*a*) each having a pair of downwardly projecting resiliently bendable tabs (20*b*) respectively on a pair of opposite edges thereof, the distance between the free ends of the downwardly projecting tabs (20*b*) in a free state being less than the thickness of the lower tab portion (18*c*) of a hanger (18), the lower tab portions (18*c*) of the two hangers (18) extending respectively through the apertures (23*a*) of the crosspieces (23) and through the apertures (20*a*) of the board-edge sealing

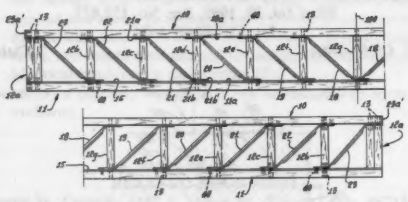
member (20) between the downwardly projecting tabs (20*b*), lower surfaces of the crosspieces (23) engaging the board-edge sealing member (20), and upper surfaces of the crosspieces 23 engaging the intermediate tabs (18*e*, 18*f*) of the respective hangers (18), a plurality of fibrous glass boards (24) providing an inner roof layer, each board (24) extending between a pair of adjacent purlins (14) and a row of the boards (24) extending along the adjacent purlins (14) between each pair of adjacent beams (12), each board (24) being provided with an impervious facing (25) and being supported adjacent one end on the board-edge sealing member (20) and the crosspieces (23) of an insulation support member (16) on one purlin (14) of a pair of adjacent purlins (14) and being supported adjacent the other end on the board-edge sealing member (20) and the crosspieces (23) of an insulation support member (16) on the other purlin (14) of the pair of adjacent purlins (14), a plurality of fibrous glass insulation batts (26) covering the inner roof layer of boards (24), and a plurality of roof panels (28) secured to the purlins (14) and covering the batts (26).

4,333,293

JOIST HAVING DIFFERING METAL WEB REINFORCEMENT

Edgar D. Jackson, Victorville, Calif., assignor to Steel Web Corporation, Alta Loma, Calif.

Filed May 19, 1980, Ser. No. 151,158
Int. Cl.³ E04C *3/292*
U.S. Cl. 52—692 **12 Claims**



1. In a truss, the combination comprises
(a) upper and lower longitudinally extending generally parallel chord members which are vertically spaced apart,
(b) multiple upright blocks which are longitudinally spaced apart along the lengths of said chord members and located therebetween, said blocks interconnecting the chord members,
(c) and multiple load carrying metallic webs in spaces between the blocks, each web having flat ends, one of which is located between the upper end of a block and the lower side of the upper chord member, and the other of which is located between the lower end of another block and the upper side of the lower chord member, said other end located closer to the center of the truss than said one end,
(d) successive webs in a direction away from the center of the truss having increasing thickness,
(e) and including nail type fasteners driven through the chord members, then through said web flat ends, and then endwise into said blocks, the number of said fasteners driven through said flat ends increasing as the thickness of the flat ends increases for successive webs in a direction away from the center of the truss.

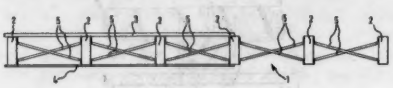
4,333,294

HERRINGBONE STRUTS

Brian Robinson, Usk, Wales, assignor to Catnic Components Limited, Caerphilly, Wales

Filed Mar. 17, 1980, Ser. No. 130,963
Int. Cl.³ E04C *3/18*
U.S. Cl. 52—695 **2 Claims**

1. A joist interconnecting strut member for securing between two adjacent joists of a building structure, comprising: an elongated body member having respective ends and a longitudinal axis having a substantially M shaped transverse cross section including means for preventing torsional buckling of said strut member comprising the legs of said M shaped cross section; the lower ends of the legs of said M shaped cross section both lying in one plane, the upper ends of the legs of said M shaped cross section both lying in another plane substantially parallel to the plane containing the lower ends of the legs of said M shaped cross section, the bottom of the middle



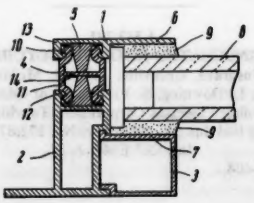
section of the M of said M shaped cross section being located at a point substantially mid-way between the plane containing the lower ends of the legs of said M shaped cross section and the plane containing the upper ends of the legs of said M shaped cross section; a flange at one of said ends and a flange at the other of said ends; said flanges being directed in opposite directions as considered from said longitudinal axis; and said flanges being inclined at an angle of greater than ninety degrees with respect to said longitudinal axis of said elongated body member.

4,333,295

CASEMENT FRAME

Bernhard Janke, Bindlach, Fed. Rep. of Germany, assignor to HEF-Fenstertechnik Vetriebs GmbH, Fed. Rep. of Germany

Filed May 22, 1980, Ser. No. 152,302
Int. Cl.³ E06B *3/26*
U.S. Cl. 52—730 **12 Claims**

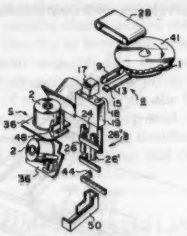


1. A frame assembly comprising a pair of open channel members, each having a central portion and substantially normally extending flanges along the longitudinal edges thereof, a spacer interposed between said channel members, said spacer being H-shaped in cross-section having a pair of lateral side walls and a central cross-bar, the ends of the lateral walls of said spacer and the flanges of said channel members being formed with cooperative engagement means, a removable plug inserted within each of the cavities formed by the lateral walls of said spacer, and the respective channel members, said plug comprising a body having a wedge shape cross-section, the larger base of said plug having a surface conforming to the central portion of said channel member and being provided with laterally extending shoulders, said surface being arranged so that it abuts the central portion of its associated channel member, and the laterally extending shoulders are compressively interposed between the flat central portion and the ends of the lateral walls of said spacer the body of said plug having a lateral dimension so as to place said cooperative engagement means under stress to lock the same.

4,333,296
COIN WRAPPING MACHINE

Kenkichi Watanabe, Tokyo, Japan, assignor to Tokyo, Japan

Filed Mar. 13, 1980, Ser. No. 129,839
Claims priority, application Japan, Mar. 15, 1979, 54-30230
Int. Cl.[3] B65B *57/04, 11/04*
U.S. Cl. 53—64 6 Claims



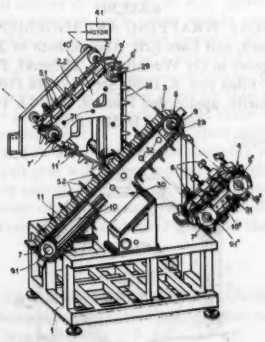
5. The improvement of claim 4, wherein said control means further comprises:

means for generating a wrapping paper supply unit replacement signal when said coin kind setting dial is set in one of said second plurality of positions.

4,333,297
CONVEYOR DEVICE FOR PACKAGING

Valentin Küttenbaum, Laupheim, and Ernst Henle, Schwendi-Weihungszell, both of Fed. Rep. of Germany, assignors to Josef Uhlmann Maschinenfabrik GmbH & Co. KG, Laupheim, Fed. Rep. of Germany

Filed May 7, 1980, Ser. No. 147,082
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1979, 2930150
Int. Cl.[3] B65B *5/00*
U.S. Cl. 53—252 9 Claims



1. A packaging device comprising:

a frame;

a first conveyor assembly on said frame for transporting packagable goods from a product-feed station along a first path extending therefrom;

a second conveyor assembly on said frame for transporting containers from a receptacle-feed station along a second path extending at least in part parallel to said first path, said assemblies each including a conveyor belt mounted on at least two wheel members rigid with respective shafts rotatably journaled on a carrier disposed within a loop formed by said belt, each of said assemblies being provided with at least one shaft formed with connector means whereby a shaft of said first assembly is drivably interlocked with a shaft of said second assembly, the carriers of said assemblies being removably secured to said frame;

feed means for delivering said goods to said product-feed station and said containers to said receptacle-feed station;

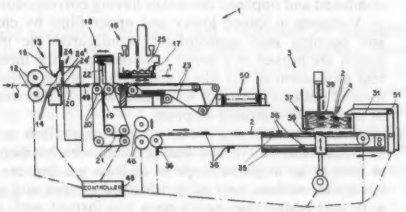
drive means on said frame connectable to at least one of said wheel members for supplying rotary power to move the belts of said first and said second assemblies along said first and said second paths, respectively; and

transport means on said frame operating in synchronism with the belts of said assemblies to move goods from said first assembly to containers on said second assembly substantially transversely to said paths at parallel portions thereof.

4,333,298
METHOD OF AND APPARATUS FOR BOXING SHOPPING BAGS

Hans Lehmacher, Im Hummerich, 5216 Niederkassel-Mondorf, Fed. Rep. of Germany

Filed Mar. 4, 1980, Ser. No. 127,064
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1979, 2908943
Int. Cl.[3] B65B *35/50, 39/00, 5/08*
U.S. Cl. 53—447 12 Claims



1. In combination with an apparatus which delivers to a stacking station a succession of like flat and flexible objects such as folded shopping bags, a packaging apparatus comprising:

means at said stacking station for stacking said objects up into a stack with said objects generally planar in said stack;

a laterally closed loading cassette in a packaging station adjacent said stacking station and having a floor formed with an elongated throughgoing slot, said floor being dimensioned to receive said stack with said objects generally planar;

transfer means including a gripper displaceable between said stations for gripping said stack in said stacking station, for displacing said stack with said objects in said stack generally planar into said cassette, and for depositing said stack with said objects in said stack generally planar on said floor over said slot;

means for positioning an upwardly open carton under and around said cassette; and

means for relatively vertically displacing said cassette and carton while simultaneously pushing said stack in said cassette through said slot with temporary deformation of said objects into U-section as same pass through said slot to leave said stack with said objects generally planar in said carton.

4,333,299

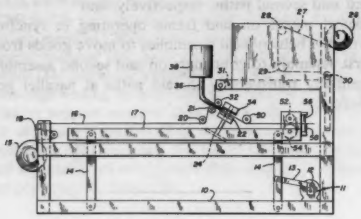
FORM FILL AND SEAL PACKAGE MAKING

Joel A. Hamilton, 101 Hardenburgh Ave., Demarest, N.J. 07627

Continuation-in-part of Ser. No. 33,844, Apr. 27, 1979, abandoned. This application Oct. 21, 1980, Ser. No. 199,229

Int. Cl.³ B65B *9/04, 9/08*

U.S. Cl. 53—450 **14 Claims**



1. Apparatus for forming, filling and sealing a pouch of film in which the upper and lower films are intermittently advanced to a pouch former whereat and in which material is discharged into the formed pouch which is then sealed after a determined filling, this apparatus including:

(a) a support frame;

(b) means for supporting lower and upper films and means for intermittently advancing said films at substantially the same speed;

(c) a delivery spout fixedly supported so as to be positioned between the lower and upper films;

(d) sealing means for forming a sequential series of sealed pockets of a U or V-shape simultaneously by and with combined and opposed die means having corresponding U or V-shapes in joined lower and upper films by closing and opening said appropriately configured die means which are moved in a timed relationship to the intermittent movement of the films, said sealing of the films into formed pockets occuring when and while the movement of films is substantially stopped;

(e) means for positioning the lower and upper films as they are brought in way of said sealing means which is disposed at least at an angle or slope of at least ten degrees to a horizontal surface, said pocket formed around said spout with said pocket having its open top formed with sufficient film material so that the material forming the pocket is not stretched as the pocket is formed around the spout;

(f) means for providing a supply of material from a supply hopper during a determined time period and to the end of said delivery spout, said spout extending within the opening of the formed pocket and at least at an angle similar to the formed pocket;

(g) means for delivering a measured flow of material through said delivery spout only after the pocket has been formed by the opposed configured die means;

(h) means for sealing the open end of the pocket after filling the pocket with a determined quantity of material;

(i) means for advancing the now formed, filled and sealed product to a severing means for separating the packaged product into a desired configuration and plurality, and

(j) means for delivering the separated and packaged product to an accumulating means.

4,333,300

ENVELOPE PROCESSING MACHINE AND METHOD

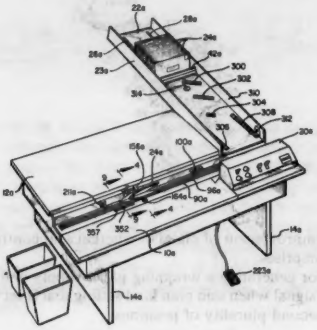
Robert J. Russell, Medford, N.J., assignor to Mail-Ex Corporation, Skokie, Ill.

Filed May 30, 1980, Ser. No. 154,873

Int. Cl.³ B65B *43/30*

U.S. Cl. 53—569 **18 Claims**

1. An envelope processing machine to facilitate operator removal of envelope contents and comprising a supply hopper for envelopes, first cutting means for severing an edge of an envelope, second cutting means for severing an adjacent and contiguous edge of an envelope, means for removing envelopes in one by one relationship from said hopper and conveyor flight means providing movable support for the envelope and for transmitting them with continuous movement along a first path of travel to and through said first cutting means to sever the edge paralleling the first path of travel of movement of the envelope, an envelope processing station, conveyor means for transmitting the envelopes with continuous movement along a



second path of travel of movement of the envelope to and through the second cutting means to sever an adjacent and contiguous edge paralleling the second path of travel of movement of the envelope and then to the processing station, and means disposed at the processing station for gripping the opposed envelope side walls and for separating and holding open said side walls by separating the severed adjacent and contiguous edges leaving the counterpart adjacent and contiguous edges connected to facilitate envelope content removal by operator gripping or sliding of the contents.

4,333,301

ROLL WRAPPING ARRANGEMENT

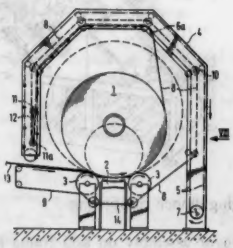
Pauli Koutonen, and Lars-Erik Alanco, both of Järvenpä, Finland, assignors to Oy Wartsila AB, Helsinki, Finland

Filed Feb. 6, 1980, Ser. No. 119,110

Claims priority, application Finland, Feb. 13, 1979, 790470

Int. Cl.³ B65B *11/04*

U.S. Cl. 53—587 **14 Claims**



1. An arrangement for wrapping big web rolls in a wrapper, which arrangement comprises a support system for supporting and rotating said roll and a stationary support frame surrounding said roll and being provided with means for leading said wrapper around said roll, said support frame being provided with a tension guide strap having a first portion in contact with the mantle surface of said roll and two parallel chains movable around the roll and interconnected over a portion with crossbars for applying said strap onto the mantle surface of said roll

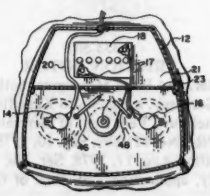
for keeping said wrapper on the mantle surface of said roll, at least some of said crossbars comprise a support means which supports a second portion of said guide strap at a distance from said roll against the tension of said strap urging it towards said roll, thereby causing said guide strap to bend off at a point between said first and said second portions from the mantle surface of said roll, said chains also having another portion free from crossbars following said crossbar portion of said chains, thereby allowing said guide strap to settle onto said roll from between said chains as said chains move around the roll, means to move said pair of parallel chains around said roll during the wrapping operation thereby to move said bending-off point of the guide strap around said roll and to cause an increasing portion of said guide strap to settle, due to its tension, onto the free mantle surface of said roll to bring the front end of said wrapper against the roll and to keep said wrapper closely thereon when rotating said roll during simultaneous feeding of the wrapper thereto and thereby wrap said roll.

4,333,302

COMBINED A.C./D.C. ELECTRIC LAWN MOWER

Ronald Thomas, 9350 S. Parnell Ave., Chicago, Ill. 60620, and Donald H. Smith, Crystal Lake, Ill., assignors to Ronald Thomas, Chicago, Ill.

Filed Mar. 13, 1981, Ser. No. 243,551
Int. Cl.³ A01D *35/262, 69/04, 69/08, 69/10*
U.S. Cl. 56—10.5 **6 Claims**



1. An electric lawn mower including a housing, and a cutting blade, said mower comprising, an A.C. motor and a D.C. motor mounted adjacent each other within the housing, a driven gear and an engageable clutch assembly associated with each respective motor for selectively imparting rotative movement from each motor to its associated driven gear, a drive gear engaged between said driven gears for interaction therewith, the drive gear being connected to the blade for imparting cutting movement thereto, whereby upon energization of either motor and its associated clutch assembly separately its associated driven gear will impart motion to the drive gear and blade and upon energization of both motors concurrently the combined power of said motors is imparted through their associated driven gears to said drive gear and the blade.

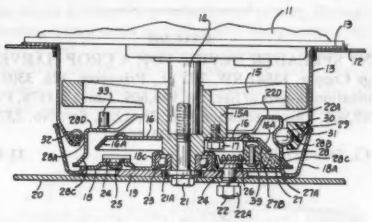
4,333,303

CLUTCH AND BRAKE MECHANISM

Gerhard R. Plamper, Valley City, Ohio, assignor to MTD Products Inc., Cleveland, Ohio

Filed Aug. 1, 1980, Ser. No. 174,681
Int. Cl.³ A01D *69/08;* **F16D** *67/02*
U.S. Cl. 56—11.3 **18 Claims**

1. A clutch and brake mechanism for a rotary type lawn mower having a motor mounted on the mower housing, a motor-driven shaft extending from the housing, and a cutting blade mounted at the free end of the shaft and adapted to be rotated by the shaft, the improvement comprising in combination, a rotatable member concentrically mounted about said shaft adjacent the free end of the shaft and adapted to be secured to the blade to rotate with the blade, a plurality of carrier members pivotally mounted to said rotatable member to swing in planes normal to the axis of said shaft, a plurality of friction elements each mounted on one of said carrier members to swing therewith radially outwardly and inwardly relative to the shaft axis, first resilient members operatively connecting said rotatable member and each of said carrier members to resiliently swing in a direction moving the friction elements radially outwardly from the axis of the shaft, each of said friction elements having an inclined braking surface and an inclined clutching surface, said braking surfaces and said clutching surfaces being disposed in concentric arcs spaced from each other, an annular clutch plate concentrically mounted about said shaft and mounted to rotate with the shaft, said clutch plate having an engaging portion adapted to clutchingly engage the inclined clutching surfaces of said friction elements to provide driving engagement between the clutch plate and the friction elements, an annular brake plate concentrically mounted about said shaft, said brake plate having an engaging portion adapted to brakingly engage the inclined braking surfaces of said friction elements to provide braking engagement between the brake plate and the friction elements, a cup member carried by said mower housing and extending from the same, a camming assembly carried by the cup mem-



ber and operatively engaging said brake plate for translating circular movement of the brake plate to longitudinal movement parallel to the axis of the shaft toward and away from the friction elements, second resilient members operatively connecting said brake plate and said cup member for resiliently urging the brake plate in a rotative direction translated to longitudinal movement toward, and into engagement with, the inclined braking surfaces of the friction elements, and a connecting member connected to the cup member adapted to be operated in opposition to the urging of said second resilient member to rotate the brake plate in a direction to move the plate member longitudinally away from the friction elements to disengage the braking surfaces of the friction elements, the radial spacing of the braking surfaces from the clutching surfaces of the friction elements being such that upon the braking engagement of the brake plate and braking surfaces, the friction elements are sufficiently pressed to swing radially on the carrier members a radial inward distance to disengage the clutching surfaces of the friction elements from the clutch plate and thereby discontinue rotation of the rotatable member and blade by said shaft.

4,333,304

ADJUSTABLE CROP GUIDE APPARATUS

James G. Greiner, Leola; Joseph J. Lehman, New Holland, and Edward H. Priepke, Lancaster, all of Pa., assignors to Sperry Corporation, New Holland, Pa.

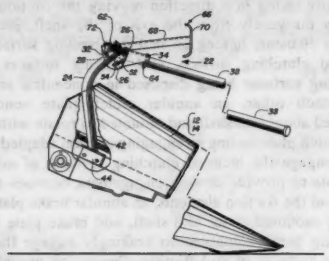
Filed Mar. 26, 1981, Ser. No. 247,963
Int. Cl.³ A01D *45/00*
U.S. Cl. 56—119 **12 Claims**

1. An adjustable crop guide apparatus comprising:

a support member including a first support post, a second support post, and means adjustably interconnecting said first and second posts;

bracket means attached to said support for movement in a first and second direction relative to said support, said

second direction being substantially perpendicular to said first direction; and



crop guide means having one end connected to said bracket for movement therewith in said first and second directions and for independent movement in said second direction relative to said bracket.

4,333,305

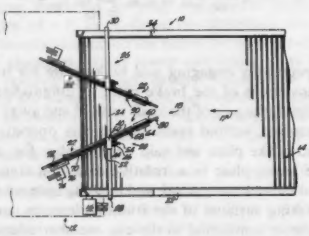
PLANT SPREADER DEVICE FOR A CROP HARVESTER

George Cooper, 13841 SW. 252 St., Princeton, Fla. 33032

Continuation-in-part of Ser. No. 914,609, Jun. 12, 1978, Pat. No. 4,189,906. This application Feb. 25, 1981, Ser. No. 237,879

Int. Cl.³ A01D *46/00*

U.S. Cl. 56—327 R **11 Claims**



1. A plant spreader device for a crop harvester, such as a tomato harvester, for discharging plants, such as tomato vines, into and generally across the width of an interior chamber of a conventional harvester after the plants have been cut from their root systems and fed onto a leading end of an existing driven, rearwardly inclined belt conveyor assembly, pivotally carried on a front end of the harvester, the plants normally being transported on a central portion of the belt conveyor from the lower leading end thereof, adjacent to an existing centrally disposed cutter means, to an upper rear end plant discharge portion thereof, said plant spreader device comprising, a bridge fixed in a spanning relation to the upper rear end discharge portion, including a main transverse span portion positioned a predetermined distance thereabove, a pair of conveyor means fixed relative to said main span portion in a depending relation therefrom, and including first end portions, extending rearwardly from first ends, overlying the upper rear end discharge portion in a predetermined spaced above relation, and diverging rearwardly from said first ends with second end portions thereof overlying the interior chamber; means extending outwardly from said pair in positions to engage the plants as they are moved upwardly rearwardly on the central belt conveyor portion, and means to drive said pair in a predetermined direction to spread the plants generally along lines of divergence defined by said pair for discharge by gravity forces, from said second end portions into the interior chamber.

4,333,306

STEEL CORD

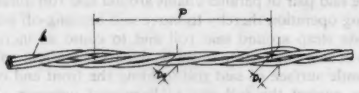
Fumio Yamashita, and Hideharu Kurobe, both of Ono, Japan, assignors to Hiroyuki Kanai, Ashiyo, Japan

Filed Dec. 22, 1980, Ser. No. 218,740

Claims priority, application Japan, Dec. 21, 1979, 54-177954[U]; Oct. 13, 1980, 55-146117[U]

Int. Cl.³ D07B *1/06;* D02G *3/48*

U.S. Cl. 57—206 **1 Claim**



1. A steel cord composed of a plurality of material wires intertwisted, wherein loosely intertwisted portions and tightly intertwisted portions alternate with each other, and wherein a distance between loosely intertwisted portions is made one pitch or two pitches and wherein the ratio of the cord diameter at a loosely intertwisted portion D_1 to the cord diameter at a tightly intertwisted portion D_2 is in the range of from 1.15 to 1.4.

4,333,307

FRICTION ROTOR

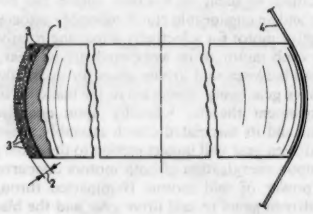
Friedrich Schuster, and Hans Hermanns, both of Hammelburg, Fed. Rep. of Germany, assignors to Kugelfischer Georg Schafer & Co., Scheinfurt, Fed. Rep. of Germany

Continuation of Ser. No. 611,859, Sep. 10, 1975, abandoned. This application Aug. 17, 1978, Ser. No. 934,538

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1974, 2443238

Int. Cl.³ D02G *1/04, 1/08*

U.S. Cl. 57—334 **6 Claims**



1. A friction rotor for false-twisting thread having a surface coating which is contacted by thread as the thread is false-twisted, said coating being more wear resistant than an uncoated area of the rotor, said coating comprising a metal layer having diamonds of relatively rounded form and with a substantially uniform mean diameter in the range of from 2 to 20 microns substantially uniformly dispersed throughout said layer and projecting outwardly from the surface of the coating in a wart-like substantially uniform manner, said metal layer being less wear resistant than the diamonds, the volume fraction of the diamonds in said coating and the size of said diamonds being correlated to match the characteristics of a thread to be false-twisted so as to provide an effective friction false-twisting operation, said surface having been finished to provide a relatively smooth surface while retaining the necessary friction characteristics to impart an effective false-twist to said thread without the thread being excessively loaded.

4,333,308

FALSE-TWIST SYSTEM SWITCHABLE BETWEEN S-TWIST AND Z-TWIST

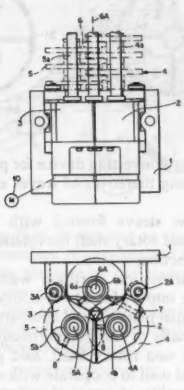
Herbert Schleyer, Schweinfurt, and Theo Bieber, Hammelburg, both of Fed. Rep. of Germany, assignors to Fag Kugelfischer Georg Schäfer & Co., Schweinfurt, Fed. Rep. of Germany

Filed Oct. 24, 1980, Ser. No. 200,552

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1979, 2943179

Int. Cl.[3] D01H 7/92; D02G 1/04

U.S. Cl. 57—339 6 Claims



1. A false-twist apparatus comprising:

a base defining a fixed assembly axis;

a fixed disk assembly including a shaft and a plurality of disks journaled in said base at said fixed axis with said shaft on said fixed axis and said disks spaced therealong;

a pair of supports on said base defining respective movable assembly axes;

respective movable disk assemblies each including a shaft and a plurality of disks journaled on said supports with said shafts on the respective movable axes and said disks spaced therealong;

respective pivot means between said base and said supports defining respective pivot axes offset from said movable axes for pivoting of said supports with the respective disk assemblies between inner positions with said disks overlapping radially and each assembly axis equispaced from the other two assembly axes and outer positions with said disks spaced radially apart;

drive means connected to said assemblies for jointly rotating said assemblies in one direction about the respective movable and fixed axes for S-twist and in the opposite direction for Z-twist; and

means releasably securing said movable disk assemblies in said supports for mounting of either of said movable disk assemblies in either support, whereby for changeover between S-twist and Z-twist said movable disk assemblies can be switched.

4,333,309

STEAM ASSISTED GAS TURBINE ENGINE

Paul D. Coronel, 208-H Eagle Heights, Madison, Wis. 53705

Filed Jan. 30, 1980, Ser. No. 116,867

Int. Cl.[3] F02C 7/047, 6/18

U.S. Cl. 60—39.09 D 10 Claims

1. A gas turbine engine having in combination a compressor, a combustion chamber downstream therefrom, means for introducing air and fuel as components which form the main stream flow entering the combustion chamber, means for maintaining combustion in the combustion chamber, at least one turbine rotor wheel bearing turbine blades downstream from the combustion chamber and driven by the combustion gas flow, wherein the improvements comprise:

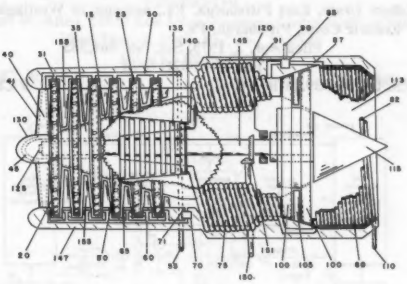
a. a rotor wheel compressor-condenser unit with at lease one compressor-condensor rotor wheel with internal passages therein capable of exchanging heat from a vapor and transferring this heat to the elastic fluid being compressed during the operation of the compressor-condenser unit, condensing the vapor to a liquid,

b. a combustion chamber comprising a burner casing, heat dilution holes in the burner casing, a heat-exchanger-boiler unit comprising annular tubing surrounding the burner casing and sealed against pressure loss of combustion gases,

c. a steam powered turbine enclosed in a casing within a main engine casing, attached to a main drive shaft, driven by an expanding heated fluid, heated by a heat absorbing process utilized to cool various components of the gas turbine engine,

d. a means of directing a fluid from a liquid pump immersed in a liquid collection tank, powered by an accessory drive shaft, through components including said heat-exchanger boiler heated by engine operation for heat absorption, into the steam turbine for production of power, through condensing components including said compressor-condenser rotor wheel for conversion to a liquid, through a liquid-air separator, and into the liquid collection tank for recycling,

e. a means of transferring the condensate from the rotating compressor-condenser wheels to fixed condensate entrance ports located within shroud corridors which are connected to condensate corridors located in the main engine casing,



f. a means to prevent loss of condensate during the transferring process utilizing high-pressure air bled from the compressor and directed through a high pressure corridor to nozzles which direct the air to compressor-condenser shroud edges, forming an air pressure seal between the shroud and the engine casing,

g. a means of utilizing incurvate corridors on the edges of the compressor-condenser shroud and the engine casing to provide uniform high pressure for sealing,

h. the use of adjustable compressor-condenser guide vanes as a means of cooling or condensing a heated fluid flowing within corridors within the guide vanes,

a means for transferring fluids between adjustable guide vanes and fluid corridors located within the main engine housing, utilizing friction seals to prevent effusion of the two separated fluids into each other, or into the interior or exterior of the main engine casing,

j. a means of boiling a fluid in an exhaust turbine-boiler rotor wheel during the operation of the engine by the flowing of a liquid into corridors, absorbing exhaust gas heat, vaporizing the liquid, and exiting through a corridor located within the rotor wheel,

k. a means of transferring a vapor and a fluid to and from said exhaust turbine-boiler rotor wheel located on the

main drive shaft through common corridors connected with the main drive shaft,

l. a means of injecting and extracting a vapor and a fluid between the main drive shaft and a fixed internal engine framework with the use of friction seals to prevent effusion of the two separated fluids into each other, or into the interior of the engine,

m. a means of providing a de-icing system for an intake cone, air intake guide vanes, and leading edges of the engine casing by utilizing the heat exchange of a condensing vapor and the resulting condensate to provide heat to these components,

n. a means of capturing exhaust gas heat through the use of a heat absorbing fluid passing through annular tubing located within an exhaust nozzle of the gas turbine engine, and

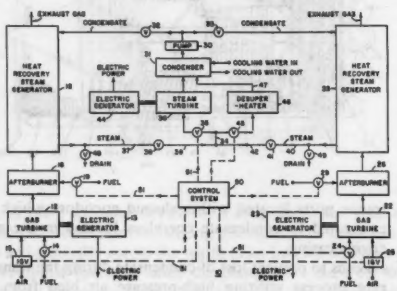
o. a means of transferring a heated fluid or vapor from the exhaust nozzle to a fuel exchanger and combustion chamber heat exchanger by utilizing corridors located within the main engine housing.

4,333,310

COMBINED CYCLE ELECTRIC POWER PLANT WITH FEEDFORWARD AFTERBURNER TEMPERATURE SETPOINT CONTROL

Robert Uram, East Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 2, 1975, Ser. No. 564,563
Int. Cl.³ F02C *6/18*
U.S. Cl. 60—39.18 B **9 Claims**



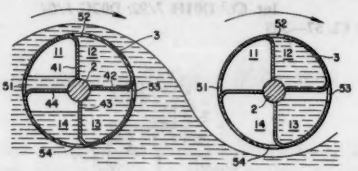
1. A combined cycle electric power plant comprising at least one gas turbine and a steam turbine, a heat recovery steam generator connected to deliver steam to said steam turbine, an afterburner connected to deliver heat to said steam generator and connected to receive exhaust gas from said at least one turbine and adapted to impart further heat to said exhaust gas, a control system for operating said plant, said control system including a gas turbine control, a steam turbine control and an afterburner control including circuitry for delivering signals representative of said received exhaust gas, said afterburner control having means for generating an afterburner control signal, said afterburner control signal generating means comprising a stored program in a programmable digital computer, said program performing the function of generating a gas temperature set point signal which is a non-linear function of said exhaust gas signal and means for selectively connecting said afterburner control signal to said afterburner for automatic control of said afterburner, whereby said steam turbine is controlled in a following mode from said at least one gas turbine.

4,333,311

WAVE ENERGY CONVERTING DEVICE

Sichi Kitabayashi, No. 919-12, Oaza Koshikiya, Ageo-shi, Saitama, Japan

Filed Oct. 11, 1979, Ser. No. 83,793
Claims priority, application Japan, Jun. 25, 1979, 54-79849
Int. Cl.³ F03B *13/12*
U.S. Cl. 60—496 **8 Claims**



1. A wave energy converting device for partial submergence in the sea for passing thereover of waves and comprising:

a rotary shaft;

a rotary hollow sleeve formed with a peripheral wall mounted on said rotary shaft for rotation therewith in one rotational direction;

a plurality of transverse partition walls partitioning said hollow sleeve into a plurality of compartments;

a plurality of radial plates in said compartments and projecting longitudinally of said compartments, each plate spanning between said rotary shaft, said partition walls and said peripheral wall to cooperate with said peripheral wall to form a plurality of water chambers in each compartment, each chamber having radial leading and trailing plates when said sleeve is rotated in said one direction; and

a plurality of first ports formed in said peripheral wall, each port being disposed closely adjacent the trailing plate of each water chamber and occupying a minor portion of the peripheral wall, means positioning said wave energy converting device partially submerged in said sea and exposed to waves passing thereover, whereby said device partially submerged in said sea with the axis of rotation of said sleeve extending horizontally for passage thereover of waves to sequentially submerge and emerge said sleeve, causes chambers having upwardly facing ports to be filled with water during submergence and chambers with downwardly facing ports to be drained during emergence, said ports being so arranged and configured relative to said water chambers and radial plates as to cause air disposed in said chambers during upward rotation of said respective chambers to the level of said longitudinal axis to be trapped to block entry of water and cause the chambers on the side of said shaft which are more nearly filled with water to be weighted downwardly relative to the chambers on the opposite side of said shaft.

4,333,312

THERMODYNAMIC ENERGY CONVERSION SYSTEM AND METHOD, UTILIZING A THERMODYNAMIC WORKING FLUID OF ENCASED EXPANDITES

Jens O. Sorensen, Rancho Santa Fe, Calif., assignor to Trade Finance International, Georgetown, Cayman Islands

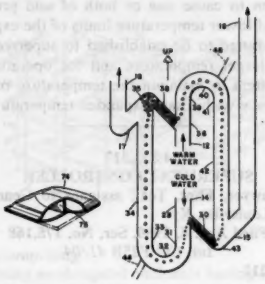
Continuation-in-part of Ser. No. 25,800, Apr. 2, 1979, Pat. No. 4,214,449. This application Mar. 10, 1980, Ser. No. 123,491
The portion of the term of this patent subsequent to Jul. 29, 1997, has been disclaimed.
Int. Cl.³ F03G *7/06*
U.S. Cl. 60—641.7 **18 Claims**

1. A method of thermodynamic energy conversion comprising the steps of:

(a) providing a thermodynamic working fluid that changes density and volume in response to changes in temperature at a given pressure;

(b) introducing the thermodynamic working fluid to a thermal fluid at different combinations of temperature and pressure;

(c) transporting the thermodynamic working fluid and the thermal fluid through a mass transport conduit circuit in response to pressure differentials created as the thermodynamic working fluid is exposed to the thermal fluid at different combinations of pressure and temperature; and



(d) converting the pressure of the transported fluids to a useful form of energy,

characterized by step (a) comprising the step of:

(e) providing a thermodynamic working fluid that comprises thousands of encased expandites.

4,333,313

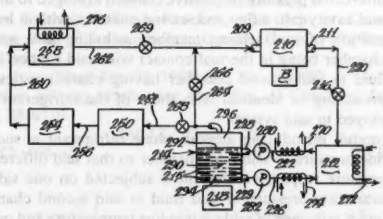
GAS POWERED, CLOSED LOOP POWER SYSTEM AND PROCESS FOR USING SAME

Joseph T. Cardone, Northridge; Kenneth J. Shatz, Hollywood, both of Calif., and James M. Dill, Ft. Lauderdale, FL, assignors to Ecological Energy Systems, Inc., Northbrook, Ill.

Continuation-in-part of Ser. No. 9,765, Feb. 6, 1979, abandoned. This application Aug. 10, 1979, Ser. No. 65,537

Int. Cl.³ F01K *25/06*

U.S. Cl. 60—649 **20 Claims**



1. A closed loop process for producing power comprising the steps of:

supplying a gas at a first pressure to a power generating means for generating power as a result of the flow of a gas through said power generating means, and allowing said gas to exit therefrom, thereby generating mechanical power;

dissolving said exiting gas from said power generating means in a solvent medium having high solvent power for said gas within a dissolving means to form a solution at a zone wherein said solvent medium comes into direct contact with said gas, said dissolution lowering the pressure of said exiting gas relative to the gas flowing into said power generating means whereby the gas flows through said mechanical power generating means as a result of the pressure differential, said lowered gas pressure being at least about one atmosphere;

providing a separating means having a body of said solution therein, said body of solution having an upper body portion and a lower body portion;

impelling said solution into said upper body portion of said solution within said separating means;

adding sufficient heat to said solution to substantially separate said dissolved gas from said solvent medium and thereby increase the pressure of the separated gas;

supplying said separated solvent medium from said lower body portion of said solution within said separating means to said zone in said dissolving means wherein said separated solvent comes into direct contact with said gas, whereby said separated solvent medium is recycled into the power generating system;

maintaining a reservoir of liquefied gas;

liquefying a portion of said separated gas and adding said liquefied gas to said reservoir;

gasifying some of said liquefied separated gas from said reservoir and readjusting the pressure thereof to said first pressure;

passing said last-named gasified product to said power generating means as at least a portion of the separated gas supplied thereto; and

passing the remainder of said separated gas at said first pressure directly from said separating means to said power generating means.

4,333,314

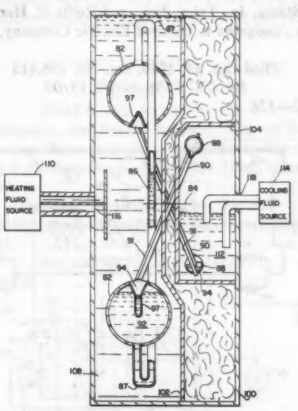
SOLAR ENERGY SYSTEM AND HEAT ENGINE THEREFOR

Robert W. Allen, 15916 Los Altos, Fountain Valley, Calif. 92708

Filed Mar. 3, 1980, Ser. No. 126,947

Int. Cl.³ F01K *7/00*

U.S. Cl. 60—675 **23 Claims**



1. A heat engine comprising

first and second tanks,

means for radially mounting said tanks for rotation with respect to an axis of rotation and so as to be spaced from each other,

conduit means connecting said first tank to said second tank for transfer of fluid therebetween,

a relatively heavy fluid disposed in said tanks for transfer therebetween,

means for heating said heavy fluid, and

means for introducing a relatively volatile fluid in a condensed state into direct contact with said heavy fluid for vaporization of said volatile fluid at predetermined times during the rotation of said tanks about said axis of rotation such that the expansion of said vaporized volatile fluid causes said heavy fluid to be cyclically transferred from a

predetermined one of said tanks to the other of said tanks so as to maintain the rotation of said tanks about said axis of rotation.

4,333,315

PROCESS FOR PREPARING A GASIFIED ICE PRODUCT

Valery B. Zemelman, Wilton, Conn.; Fredric Kleiner, New City, and Michael J. Kuchman, Hopewell Junction, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 4, 1981, Ser. No. 260,147
Int. Cl.³ F25C *1/00*
U.S. Cl. 62—1 **17 Claims**

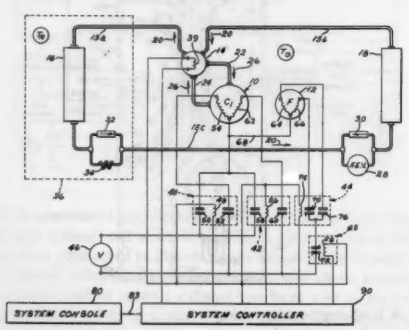
1. A process for preparing gasified ice characterized by high degree of mechanical strength in its frozen state and a high gas content, which comprises: contacting aqueous liquid in a pressurized vessel with a conditionally-stable, hydrate-forming gas under conditions of pressure and temperature effective to form a stable gas hydrate; vigorously agitating the aqueous liquid during the period of contact to provide bubbles of the gas dispersed therein in continuous, efficient mass transfer contact; maintaining contact for a period of time effective to form a suspension comprising gas hydrate dispersed within said carbonated aqueous solution; degassing the suspension while maintaining said suspension under pressure by agitating to a degree effective to dislodge unreacted and undissolved gas bubbles from the suspension and permit them to rise to the upper surface thereof; transporting the essentially gas-bubble-free suspension through a port in the vessel while under pressure to a pressurized freezing vessel; and freezing the essentially gas-bubble-free suspension under pressure.

4,333,316

AUTOMATIC CONTROL APPARATUS FOR A HEAT PUMP SYSTEM

Custis L. Stamp, Jr., Tyler, Tex., and Rollie R. Herzog, Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Oct. 14, 1980, Ser. No. 196,413
Int. Cl.³ F25B *49/00, 13/00*
U.S. Cl. 62—126 **13 Claims**



1. In a heat pump system, automatic control apparatus for switching the heat pump system from a normal functional operating mode to a standby operating mode in which temperatures in the conditioned space are maintained within an expanded temperature range having predetermined upper and lower temperature limits, the control apparatus comprising:

means for receiving and storing user-selected volatile data representing a desired target temperature for the conditioned space and a desired functional operating mode for the heat pump system;

means for supplying a data check code signal, the status of which indicates the validity or invalidity of the data signals emanating from the volatile data storage means;

means repetitively responsive to the stored volatile data signals and to valid data check code signals for operating the heat pump system in the user-selected functional operating mode and for entering the heat pump system into the standby mode when a predetermined number of invalid data check code signals are repetitively sensed in sequence;

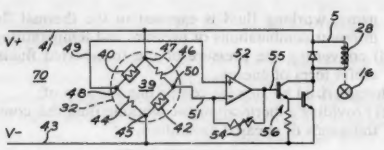
and standby means responsive to an enter standby mode instruction to cause one or both of said predetermined upper and lower temperature limits of the expanded temperature range to be established to supersede the user-inserted target temperature and for operating the heat pump system to maintain the temperature of the conditioned space within said expanded temperature range.

4,333,317

SUPERHEAT CONTROLLER

George N. Sawyer, Flint, Tex., assignor to General Electric Company, Louisville, Ky.

Filed Aug. 4, 1980, Ser. No. 175,168
Int. Cl.³ F25B *41/04*
U.S. Cl. 62—212 **4 Claims**



1. A refrigerant flow control system for a refrigeration system of the type having a compressor including a discharge and suction conduit, a condenser, an electro-mechanical expansion means for regulating refrigerant flow in said system and an evaporator for receiving liquid phase refrigerant at an inlet and providing gaseous phase refrigerant at an outlet; means controlling said expansion means in accordance with the superheat condition at said suction conduit by regulating the admission of liquid phase refrigerant to said evaporator comprising:

a sensing member including a cavity;

a differential pressure responsive element arranged to divide said cavity into a first and second chamber with at least a portion of said sensing member including said second chamber being in thermal contact with said suction line;

a fluid in said second chamber having characteristics approaching or identical with those of the refrigerant employed in said system;

a conduit introducing gaseous phase refrigerant at suction line pressure to said first chamber so that said differential pressure responsive element is subjected on one side to saturation pressure of said fluid in said second chamber under influence of said suction line temperature and on the other side to refrigerant in said first chamber at suction line fluid pressure;

a differential pressure sensing means arranged on said differential pressure responsive element for sensing the difference in pressure between said first chamber and second chamber, said differential pressure sensing means including strain sensing resistive elements whose resistance varies as a function of pressure differential between said chambers;

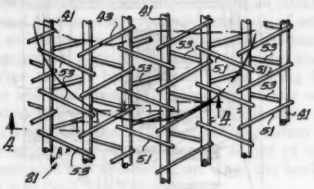
a signal means for producing an electrical signal from the action of the said differential pressure sensing element for controlling operation of said electro-mechanical expansion means; and

control means for causing said electric signal to activate said electro-mechanical expansion means for controlling the superheat condition of said gaseous phase refrigerant in said suction conduit in accordance with the pressure differential between said first and second chambers.

4,333,318
CO_2 FREEZER

Lewis Tyree, Jr., 145 Briarwood Ave., North, Oak Brook, Ill. 60521

Filed May 4, 1981, Ser. No. 259,968
Int. Cl.³ F25D *17/02*
U.S. Cl. 62—374 10 Claims



1. A CO_2 comprising

means defining an elongated enclosure having an entrance at one end and an exit at the opposite end,

an endless porous belt conveyor for carrying material to be cooled along a path from said entrance to said exit, said endless belt having an upper operating run and a lower return run which are vertically spaced apart to provide an intermediate region therebetween,

CO_2 injection means located in said enclosure to expand high pressure liquid CO_2 through a nozzle to create CO_2 snow plus cold CO_2 vapor, and

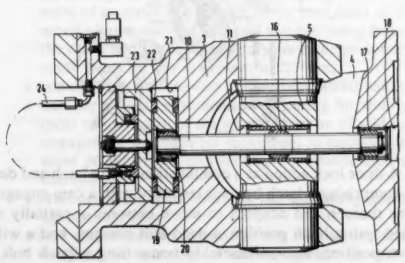
blower means located in said intermediate region and aimed at an angle of between about 5° and about 35° upward from the horizontal,

said belt including a plurality of longitudinally spaced transverse rod means and a plurality of belt sections which are interconnected by said transverse rod means whereby said belt effectively deflects cold CO_2 vapor being discharged by said blower means upward against the undersurface of mateial being carried along said endless belt.

4,333,319
UNIVERSAL JOINT ASSEMBLY

Walter Bischoff, Münster-Wolbeck, Fed. Rep. of Germany, assignor to Gelenkwellenbau GmbH, Essen, Fed. Rep. of Germany

Filed Jun. 24, 1980, Ser. No. 162,530
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1979, 2926710
Int. Cl.³ F16D *3/26*
U.S. Cl. 464—26 7 Claims

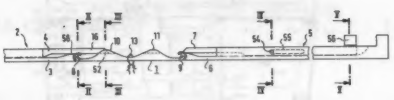


1. A universal joint assembly comprising: first and second yoke means; trunnion cross means operatively connected between said first and second yoke means for torque transmission therebetween; means defining a generally centralized bore extending through said trunnion cross means between said first and second yoke means; bolt means extending within said bore connected between said first and second yoke means through said trunnion cross means; radially movable means in said first yoke means having said bolt means angularly movably received therein; and locking means for locking said radially movable means in any selected position thereof.

4,333,320
LEFT-LEFT FLAT KNITTING MACHINE

Gottfried Kuhnert, Aalen, Fed. Rep. of Germany, assignor to Universal-Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG, Westhausen, Fed. Rep. of Germany

Filed Dec. 11, 1979, Ser. No. 102,518
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1978, 2853819; Mar. 9, 1979, 2909339
Int. Cl.³ D04B *7/06*
U.S. Cl. 66—63 11 Claims

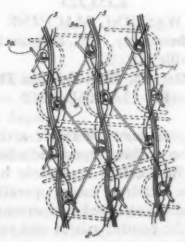


1. A left-left flat knitting machine with two needle beds arranged in a common plane, knitting needles provided with needle hooks at both ends thereof, and bars provided in the needle bed channels of both needle beds to activate said knitting needles, characterized in that said knitting needles are formed as double hook needles without pivoted tongues for closing said hooks and (1) having two needle humps substantially the same height as said needle hooks (10,11) and that the bars are so formed as to act only as push bars (2,5), each composed of a stitch transfer bar (3,6) and a tongue bar (4,7) having integral feet.

4,333,321
KNITWARE STRUCTURE

Manfred Schneider, and Frank Schubert, both of Karl Marx Stadt, German Democratic Rep., assignors to Veb Wirkmaschinenbau Karl-Marx-Stadt, Karl Marx Stadt, German Democratic Rep.

Filed Feb. 28, 1980, Ser. No. 126,857
Claims priority, application German Democratic Rep., Mar. 4, 1979, 211561
Int. Cl.³ D04B *23/08, 23/10*
U.S. Cl. 66—192 5 Claims

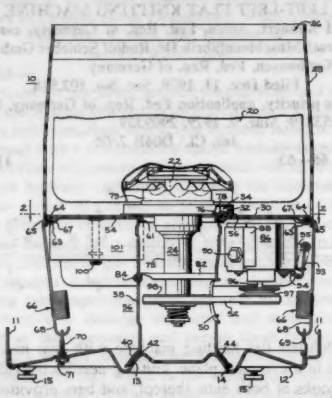


1. Knitted goods, particularly pile-knit goods, comprising a base fabric formed of weft yarn elements and interlooped warp yarns defining therewith wales and courses, said weft yarn elements extending over at least two wales; and pile yarns tied into the loops of the warp yarns and including pile-forming components tied with the warp yarns in every second course and non-patterning components tied as standing weft in one respective wale into the in between courses.

4,333,322
MOUNT FOR WASHING MACHINE

David L. Billings; Robert M. Fey, and Richard A. Waugh, all of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Dec. 11, 1980, Ser. No. 215,217
Int. Cl.[3] D06F *37/24*
U.S. Cl. 68—23.2 13 Claims



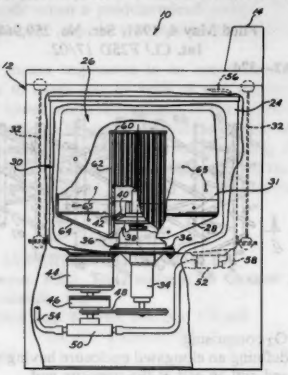
1. An upright fabric washing machine comprising:
a cabinet structure having a bottom frame including a bearing for pivotally supporting an assembly of working parts of said machine;
a mount including a hollow mounting post pivotally supported on said bearing and extending generally vertically upward within said cabinet structure and a plurality of mounting arms, each of said mounting arms being attached to the upper portion of said mounting post and extending outwardly in a generally horizontal direction;
a non-rotatable tub having a peripheral side wall and a bottom wall defining an access opening therethrough;
means securing said tub to said mount with said tub bottom wall supported by said mounting arms and with the access opening in register with said hollow mounting post;
a transmission enclosed in a housing and having an output member extending from an upper end of said housing; and
means securing said housing to said mount with said housing disposed substantially within said mounting post and said output member extending upwardly within said tub.

4,333,323
WASHING MACHINE

Vijay K. Stokes, Schenectady, N.Y., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 15, 1980, Ser. No. 216,119
Int. Cl.[3] D06F *21/06*
U.S. Cl. 68—171 4 Claims

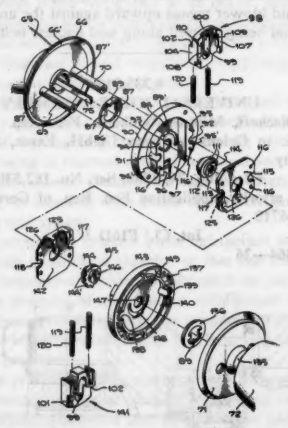
1. In a washing machine for fabric articles comprising a receptacle to receive washing liquid and a fabric article load to be washed in the liquid, said receptacle having a generally vertical central axis; and drive means operatively connected to said receptacle and constructed and arranged to move said receptacle so that the central axis of said receptacle moves in an orbital path; said receptacle comprising:
(a) a generally upright circumferentially outer wall;
(b) a generally upright center post spaced radially inward of said outer wall and having a circumferentially outer surface for engaging fabric articles, said outer surface being textured to minimize slippage between said outer surface and fabric articles; and
(c) an annular bottom wall interconnecting the lower ends of said outer wall and said center post, said bottom wall having an upper surface textured to maximize slippage between said upper surface and fabric articles, said upper surface being contoured to slope downwardly substantially continuously from said outer wall to said center post and to undulate circumferentially of said receptacle.



4,333,324
SPRING/DEAD BOLT LOCK ASSEMBLY

Hagen Dietrich, Delta, and William J. Fane, North Vancouver, both of Canada, assignors to Norris Industries, Inc., Huntington Beach, Calif.

Continuation-in-part of Ser. No. 35,208, May 2, 1979, Pat. No. 4,255,953. This application Jun. 23, 1980, Ser. No. 161,899
Int. Cl.[3] E05B *59/00, 55/00*
U.S. Cl. 70—107 10 Claims



1. A door lock acting as a combination spring latch and dead bolt comprising a latch bolt subassembly with a cam engaging means thereon and adapted to move between a partially extended spring latch position, a dead bolt position, and a withdrawn position, said subassembly comprising a latch bolt, a bolt extension and a case extension in longitudinal alignment, latch bolt actuating means comprising a spindle means and a main cam member on said spindle means having an operating engagement with said cam engaging means, a key actuated outside operating assembly including a spring latch release member in operating relationship with said spindle means, an inside operating assembly including a spring latch release

member and a turn member in operating relationship with said spindle means, outside driving means adapted to engage said spindle means for driving said spindle means in a rotating direction, an outside drive housing having an outside drive element thereon in a transversely reciprocating path of movement and adapted to engage said outside driving means, and a rotatable drive member between said outside spring latch release member and said outside drive housing, an inside driving means adapted to engage said spindle means for driving said spindle means in a rotating direction, an inside drive housing having a transversely reciprocating path of movement and having an inside drive element thereon in continuous progressive engagement with said inside drive means, and a rotatable cam drive member between said inside spring latch release member and said inside drive housing, a clear way between said outside drive housing and said outside drive means when said latch bolt subassembly is in dead bolt position whereby the outside spring latch release member is free of operating engagement with said spindle means when the latch bolt subassembly is in dead bolt position.

4,333,325

STEERING SHAFT LOCKING DEVICE

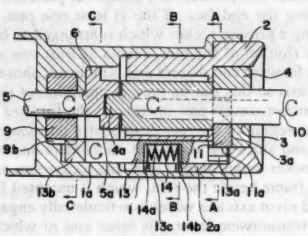
Minoru Morikawa, Nagoya; Sadao Kokubu, Iwakura, and Tadashi Hirai, Nagoya, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Apr. 20, 1979, Ser. No. 32,105

Claims priority, application Japan, Apr. 24, 1978, 53/55510[U]

Int. Cl.³ B60R *25/02*; E05B *65/12*

U.S. Cl. 70—186 **4 Claims**



1. A steering shaft locking device, comprising:

a housing;

a locking rotor rotatably mounted in said housing and having key actuated means for locking said rotor against rotation in said housing and a slot for receiving a key for actuating said key actuated means;

a movable piece mounted in said locking rotor for movement of an outer end thereof to the periphery of the rotor when a key is inserted into said slot and being free to allow the outer end to move inwardly from the periphery of the rotor when no key is present in the slot;

a cam connected to the end of said rotor within said housing;

a lock bar slidably mounted in said casing for sliding movement transversely of the axis of rotation of said rotor and engaged by said cam for movement in response to movement of said rotor and having a projection on an edge thereof;

a first spring engaging said lock bar for urging said lock bar against said cam;

a lock shaft mounted in said housing for rotation around the longitudinal axis thereof and being held in said housing against movement in the axial direction thereof, said lock shaft having one end adjacent said projection on said lock bar and engaged by said projection for being rotated by said lock bar from a neutral rotational position in one rotational direction when said lock bar is moved in the one direction by said cam, and being rotated by said lock bar from said neutral rotational position in the other direction when said lock bar is moved in the other direction by said first spring, and having the other end adjacent the outer end of said movable piece, said other end having a shape for engaging said movable piece and urging it inwardly of said rotor when said lock shaft is rotated in said other rotational direction and moving out of contact with the periphery of said rotor when said lock shaft is rotated in said one direction; and

a second spring engaging said lock shaft for urging said lock shaft to said neutral rotational position from a rotational position in either rotational direction from said neutral rotational position, said second spring being weaker than said first spring.

4,333,326

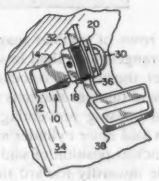
BRAKE AND CLUTCH LOCK ASSEMBLY

Robert E. Winters, 519 W. 16th Pl., Chicago Heights, Ill. 60411

Filed Jul. 16, 1980, Ser. No. 169,833

Int. Cl.³ B60R *25/00*; G05G *5/06*

U.S. Cl. 70—203 **1 Claim**



1. An apparatus useful for substantially immobilizing the shaft of a foot pedal assembly normally necessary to completely control the operation of a vehicle having a floor, said apparatus comprising base means being a rigid structure, and having a first end and a second end, said first end having a larger cross sectional area than said second end, and said base means being sized to fit between said floor and said shaft, provided that in use said first end is in contact with said floor, first wall means and second wall means each extending upwardly from said second end of said base means and being spaced apart so as to be capable of cradling said shaft between said first and second wall means and said second end of said base means, each of said first and second wall means having a pair of holes therethrough equidistant up from said second end of said base means, lock means capable of passing through at least one of said holes in each of said first and second wall means to thereby effectively lock said shaft in said cradled position and rendering said foot pedal assembly effectively inoperative.

4,333,327

MAGNETIC TUMBLER LOCK

Kiyoyasu Wake, Tokyo, Japan, assignor to Miwa Lock Co., Ltd., Tokyo, Japan

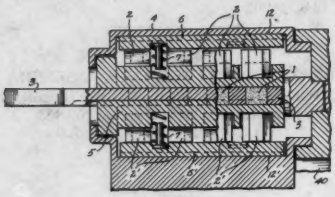
Continuation of Ser. No. 867,665, Jan. 9, 1978, abandoned. This application Feb. 7, 1980, Ser. No. 119,286

Int. Cl.³ E05B *47/00*

U.S. Cl. 70—276 **7 Claims**

1. A magnetic actuated lock mechanism comprising an external housing, an inner cylinder which is adapted to turn in said external housing, said inner cylinder having a keyhole for receiving a key axially therein, there being arranged two rows of tumbler magnets in said inner cylinder, said tumbler magnets being adapted to turn about a rotary axis transverse of the longitudinal axis of the inner cylinder; said tumbler magnets being magnetized through a process of partial magnetization producing both a north and south magnetic poles on the end adjacent to said keyhole; a magnetic key provided with a key magnet corresponding to each of said tumbler magnets for

co-operating with each of said tumbler magnets, said key magnets being magnetized through a process of partial magnitization producing both a north and south magnetic poles on the end adjacent to said tumbler magnets, said tumbler magnets and said key magnets being substantially coaxially oriented in pairs so that the magnetic flux passes through the interior of the key magnets and through the interiors of the rotatable tumbler magnets along a curved line and beyond the key magnets whereby each tumbler magnet is rotatably operable by a single key magnet and said tumbler magnets are each rotated into an unlocked position upon insertion of said key; and a bolt rod extending in the direction of length of the inner cylinder,



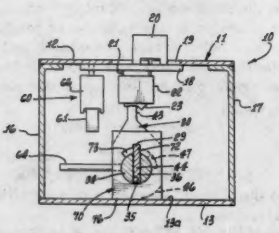
adjacent said two rows of tumbler magnets, said mechanism constructed and arranged such that, in said locked position of said tumbler magnet, the bolt rod is locked outwardly abutting the top surface of said tumbler magnets and within an interior slot in the external housing preventing relative angular displacement between said inner cylinder and said external housing and in said unlocked position of said tumbler magnets, the bolt rod is movable inwardly toward the longitudinal axis of the inner cylinder into a slot formed by aligned recesses in said tumbler magnets when said tumbler magnets are rotated into the unlocked position by insertion of a proper magnetic key, whereby said inner cylinder is rotatable with respect to said external housing.

4,333,328

ACCESS IDENTIFICATION APPARATUS

John D. Platt, S. Laguna, Calif., assignor to A.R.M., Costa Mesa, Calif.

Filed May 2, 1980, Ser. No. 146,009
Int. Cl.³ E05B *49/00*; H01H *9/28*
U.S. Cl. 70—278 **26 Claims**



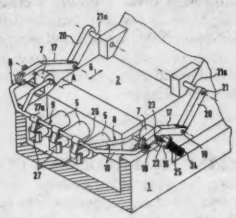
1. In access identification apparatus,
(a) a plurality of switch actuating elements,
(b) a key having identity shoulders corresponding to selected ones of said elements,
(c) means including structure to receive insertion of the key and responsive to movement of said identity shoulders to effect activation of the switch elements corresponding to said shoulders, and
(d) a housing and a receptacle mounted on the housing, said receptacle carrying said switch actuating elements to be rocked back and forth between two positions by said structure which includes plates having exterior tangs engageable with said respective elements, said elements rocking counterclockwise as said tangs rotate clockwise, and vice versa.

4,333,329

CROSS TRANSPORT PRESS

Hans Richner, Büsserach, Switzerland, assignor to Hatebur Umformmaschinen AG, Reinach, Switzerland

Filed Feb. 11, 1980, Ser. No. 120,232
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1979, 2907464
Int. Cl.³ B21D *55/00, 37/16*
U.S. Cl. 72—3 **8 Claims**



1. A cross transport press comprising: a press frame; a press carriage mounted in sliding bearings, which is arranged to be driven in reciprocation through a crank transmission and to a forward end of which is rigidly attached at least one ram for shaping metal components; and means for periodically sensing and cooling the end face of the at least one ram, the means comprising a sensing rocker which is arranged to be driven in the work rhythm of the ram, carries at least one sensing element at a forward end thereof and is mounted about a horizontal pivot axis so that during normal operation of the press the sensing rocker travels past in front of the forward end of the ram in the region of the rear dead-centre position of the press carriage and stops the press if it encounters an obstacle, the sensing rocker comprising at least one rocker arm arranged on the press frame beside the ram, which is mounted for rotation about said pivot axis and which is articulatedly engaged by one end of a transmission lever, the other end of which is operatively driven from a crank transmission, a stop being provided on the rocker arm which determines the lower position of the transmission lever and the transmission lever is further retained on the stop of the rocker arm by an elastic element so that the transmission lever lifts from the said stop counter to the return force of the elastic element if the sensing element is unable to attain its lower limit position.

4,333,330

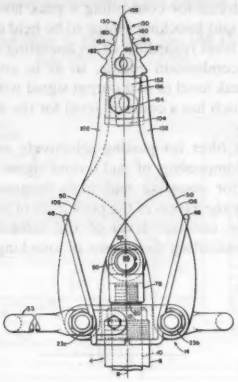
SPREADER TOOL

Thomas M. Porter, Concord, Mass., assignor to H. K. Porter, Inc., Somerville, Mass.

Filed Apr. 21, 1980, Ser. No. 141,896
Int. Cl.³ B66F *3/00*
U.S. Cl. 72—392 **6 Claims**

1. A spreader tool for providing a controlled level of force in operation, the tool comprising a fluid operated jack, said jack comprising a cylinder having a longitudinal axis and a open forward end and a piston element having a forward end operatively disposed for axial movement in said open forward end of said cylinder; first support means mounted on said forward end of said piston; at least two roller means mounted in spaced adjacent relation on said first support means such that their common axis of rotation is normal to the longitudinal axis of said cylinder; second support means mounted about the periphery of said open forward end of said cylinder; and a pair of force arms separately, pivotally mounted on said second support means on opposite sides of said cylinder about pivot axes which are parallel to each other and to said axis of rotation

of said roller means, each said force arm having a distal load engaging portion and a curved inner edge extending over and bearing against one of said roller means, whereby axial movement of said piston out of said cylinder will cause the respective roller means to roll along the inner edges of the respective force arms forcing same apart and the curvature of said inner edges being such that said force transmitted from said jack to said force arms is controlled.



4,333,331

CALIBRATING UNIT FOR CALIBRATING A HYDRAULIC OR ELECTRIC PRESSURE GAUGE, ESPECIALLY OF A PROBING DEVICE

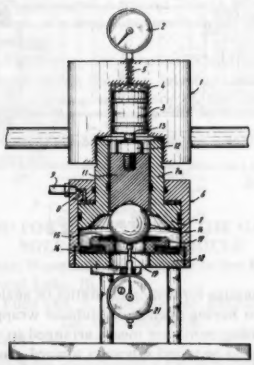
Adriaan B. Mann, Delft, Netherlands, assignor to Goudsche Machinefabriek B.V., Gouda, Netherlands

Filed Aug. 13, 1980, Ser. No. 177,771

Claims priority, application Netherlands, Aug. 17, 1979, 7906279

Int. Cl.³ G01L *27/00*

U.S. Cl. 73—4 R **6 Claims**



1. Calibrating unit for calibrating a hydraulic or electric pressure gauge especially of a probing device, wherein the calibrating unit comprises at least a housing having a wall, and upper side, and a bottom plate, a piston mounted within said housing and having a connecting portion protruding from the upper side of the housing for connecting the piston with a casing of the pressure gauge to be calibrated, a supply channel in the wall of the housing for supplying hydraulic liquid to load the piston, a pressure piece movable within the piston and having an upper side, a lower side and a lower face, said pressure piece being able to be loaded at its upper side by a measuring member of the pressure gauge to be calibrated and to load at its lower side a spring element resting on the housing, and a measuring watch or the like for determining the movement of the pressure piece.

4,333,332

DIFFERENTIAL SCANNING MICROCALORIMETER

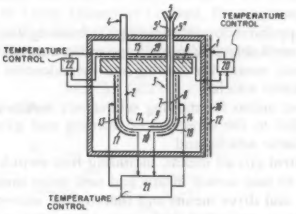
Peter L. Privalov, ulitsa Obrucheva, 28 korpus 2, kv. 145, Moscow, U.S.S.R.

Filed May 21, 1980, Ser. No. 152,140

Claims priority, application U.S.S.R., May 21, 1979, 2760252

Int. Cl.³ G01N *25/20*

U.S. Cl. 374—10 **5 Claims**



1. A differential scanning microcalorimeter, comprising:

an adiabatic shell with an external surface;

a first capillary calorimetric chamber enclosed in said adiabatic shell, provided with an external surface, with a first end extending from said adiabatic shell, and with a second end disposed inside said shell;

a second capillary calorimetric chamber also disposed in said adiabatic shell and provided with an external surface, with a first end extending from said adiabatic shell, at least one of said capillary calorimetric chambers being made in the form of two capillary tubes in thermal contact with each other over the full length thereof; with first ends constituting a first end of said at least one of said chambers extending from said adiabatic shell, and with second ends constituting a second end of said at least one of said chambers enclosed inside said shell and communicating with the second end of the other of said chambers;

a heat bypass disposed in said adiabatic shell, limiting working volumes of said calorimetric chambers and serving to pass said first ends of said chambers extending from said shell;

a first thermal sensitive element located on said external surface of said adiabatic shell;

a second thermal sensitive element located on said external surface of said first capillary calorimetric chamber;

a third thermal sensitive element located on said external surface of said second capillary calorimetric chamber;

a first heating element located on said external surface of said adiabatic shell;

a second heating element located on said external surface of said first capillary calorimetric chamber;

a third heating element located on said external surface of said second capillary calorimetric chamber; and

a set of temperature controls electrically coupled with said thermal sensitive elements and said heating elements.

4,333,333

APPARATUS FOR DETERMINING THE BURNING AND/OR GLOWING RATES OF A SMOKABLE ARTICLE

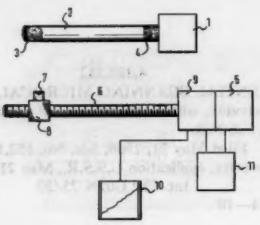
Dirk Pangritz, Halstenbek, Fed. Rep. of Germany, assignor to B.A.T. Cigaretten-Fabriken GmbH, Hamburg, Fed. Rep. of Germany

Filed Nov. 24, 1980, Ser. No. 210,050

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1979, 2947249

Int. Cl.³ G01N *21/72*

U.S. Cl. 374—8 7 Claims



1. An apparatus for determining the burning and/or glowing rate of a smokable article, said apparatus comprising:

(a) sensor means for sensing the incandescent zone of the smokable article;

(b) drive means for moving said sensor means along a path parallel to the direction of burning and glowing of the smokable article; and

(c) control circuit means, including first switch means coupled to said sensor means and said drive means for stopping said drive means and thereby the movement of said sensor means when said sensor means detects a predetermined radiation intensity and for starting said drive means and thereby said sensor means when said sensor means detects a radiation intensity other than said predetermined intensity when said first switch means are in a first state, and for starting said drive means and thereby the movement of said sensor means when said sensor means detects a predetermined radiation intensity and for stopping said sensor means when said sensor means detects a radiation intensity other than said predetermined intensity when said first switch means are in a second state.

4,333,334

KNOCKING DISCRIMINATION APPARATUS

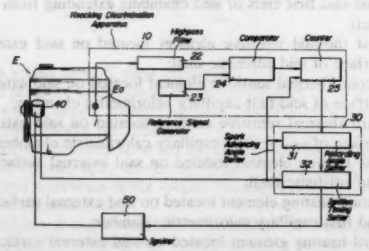
Yasuo Nakajima, Yokosuka, and Kazuhiro Kikuchi, Yokohama, both of Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Apr. 25, 1980, Ser. No. 143,715

Claims priority, application Japan, Apr. 26, 1979, 54-51659

Int. Cl.³ G01L *23/22*

U.S. Cl. 73—35 7 Claims



1. A knocking discrimination apparatus for discriminating a degree of knocking taking place in an internal combustion engine, wherein an output signal of a knocking sensor for detecting a vibration caused by the knocking is compared with a reference signal for the discrimination of knocking, comprising:

a control circuit for controlling a peak level of the output signal of said knocking sensor to be held at a substantially constant level regardless of an operating condition of the internal combustion engine, so as to compare the controlled peak level of said output signal with said reference signal which has a constant level for the discrimination of knocking;

a high pass filter for passing selectively at least high frequency components of said output signal; and

a counter for counting said high frequency components caused by the excess of the peak level of said output signal above the constant level of the reference signal, said counter indicating the degree of knocking present in said engine.

4,333,335

APPARATUS FOR TESTING THE WRAPPERS OF CIGARETTES OR THE LIKE

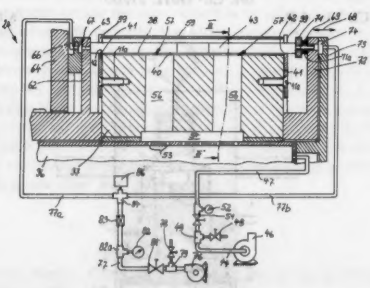
Uwe Heitmann, Hamburg, and Willy Rudszinat, Dassendorf, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 384,279, Jul. 31, 1973, abandoned. This application Apr. 26, 1979, Ser. No. 33,387

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1972, 2237971

Int. Cl.³ G01N *15/08*

U.S. Cl. 73—41 11 Claims

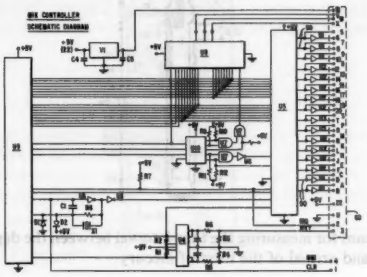


1. In an apparatus for testing cigarettes or analogous articles consisting of or having open-ended tubular wrappers, a combination comprising conveyor means arranged to transport successive articles to be tested sideways toward, past and beyond a testing station and including pairs of spaced-apart article supporting elements with each pair of supporting elements engaging spaced-apart portions of the wrapper of an article during travel toward, past and beyond said testing station, said conveyor means further having at least one opening provided intermediate each of said pairs of supporting elements and being spaced apart from the wrappers of articles in the respective supporting elements; and suction generating means communicating with said openings while said openings travel toward, past and beyond said testing station so that the streams of air flowing into said openings attract the wrappers of articles to the respective pairs of supporting elements.

4,333,336
APPARATUS FOR COMPUTING FLOW RATE OF THERMOPLASTIC MATERIAL

Carl A. Myerholtz, and Ralph W. Myerholtz, Jr., both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 7, 1980, Ser. No. 148,153
Int. Cl.³ G01N *11/04*
U.S. Cl. 73—56 **7 Claims**



1. In a device for determining the flow rate of a thermoplastic material in accord with Procedure B of ASTM Method D1238 using an extrusion plastometer, the improvement comprising

means for entering one or more numerical factors specified by said ASTM Method D1238 for said thermoplastic material into an input/output device capable of being read by a microprocessor,

means for initiating an electronically timed interval when a change of state is detected in a switch designed to undergo a first change of state after displacement of said thermoplastic material begins in said plastometer,

means for checking the status of said switch at predetermined intervals,

means for ending said electronically timed interval when said switch undergoes a second change of state upon the displacement of a predetermined volume of said thermoplastic material,

means for determining the duration of said timed interval,

means for calculating the flow rate for said thermoplastic material by dividing said factor by the duration of said timed interval, and

means for displaying said flow rate in a convenient input-/output device.

4,333,337
METHOD FOR DETERMINING THE GASOLINE MILEAGE FOR A VEHICLE

John A. Marten, Wauconda, Ill., assignor to Sun Electric Corporation, Crystal Lake, Ill.

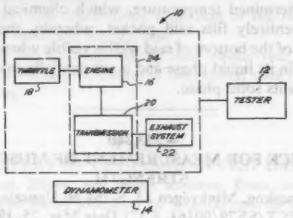
Filed Oct. 9, 1980, Ser. No. 195,526
Int. Cl.³ G01F *9/00*
U.S. Cl. 73—114 **14 Claims**

1. In a method for determining a gasoline mileage rating for a vehicle of the type wherein said vehicle is operated on a dynamometer at a city driving speed and monitored to provide data sufficient to calculate said gasoline mileage rating therefrom, said vehicle having a weight, a predetermined driveline, and delivering a horsepower during operation at said city driving speed, the improvement comprising the steps of:

(a) selecting a test horsepower value for said vehicle based upon said weight, said predetermined driveline, said city driving speed and a predetermined acceleration rate related to typical city driving characteristics;

(b) starting said vehicle and accelerating said vehicle to said city driving speed;

(c) setting said dynamometer to maintain said city driving speed;



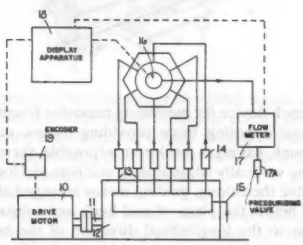
(d) adjusting said horsepower delivered by said vehicle to substantially equal said test horsepower value; and

(e) then initiating said monitoring of said vehicle.

4,333,338
FUEL PUMP TEST EQUIPMENT

Daniel F. Patey, and Paul M. Doyle, both of London, England, assignors to Lucas Industries Limited, Birmingham, England

Filed Jul. 17, 1980, Ser. No. 169,782
Claims priority, application United Kingdom, Sep. 15, 1979, 7932089
Int. Cl.³ G01M *19/00*
U.S. Cl. 73—119 A **6 Claims**



1. A test equipment for use when testing a fuel injection pump of the kind intended to supply fuel to a multicylinder internal combustion engine, the test equipment comprising means defining a chamber, a plurality of nozzles having inlets for connection to the outlets of the injection pump respectively, said nozzles being positioned to direct liquid into said chamber, a restricted outlet from said chamber, a pressure transducer for providing a signal indicative of the pressure variation in said chamber as fuel is directed into the chamber from the nozzles in turn, and a display apparatus which receives the signal from said transducer and displays the pressure variations in said chamber.

4,333,339
STEAM TRAP MONITOR

Gerald W. McNeely, Arden, and Gerardus L. J. Tummers, Asheville, both of N.C., assignors to Akzona Incorporated, Asheville, N.C.

Continuation-in-part of Ser. No. 132,581, Mar. 21, 1980, abandoned. This application May 6, 1980, Ser. No. 147,038
Int. Cl.³ G01K *11/06, 11/16, 11/18, 1/20*
U.S. Cl. 116—217 **8 Claims**

1. A temperature indicator comprising:

(a) a substrate having an embossed well therein;

(b) a substantially transparent cover over and in intimate contact with said well, to form an enclosed pocket, whereby at least one of the substrate and cover is air

permeable, and the bottom of said well has a detectable color, said well containing a chemical which is solid below a predetermined temperature and liquid above said predetermined temperature, which chemical in its solid state entirely fills said pocket, whereby the detectable color of the bottom of said well is visible when said chemical is in its liquid phase and is substantially invisible when it is in its solid phase.

4,333,340

DEVICE FOR MEASUREMENT OF MUSCULAR STRENGTH

Alf U. Elmeskog, Minkvägen 13, S-754 60 Uppsala, Sweden

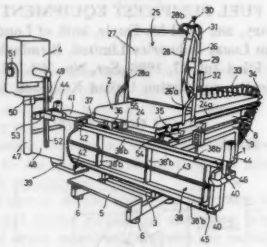
PCT No. PCT/SE79/00161, § 371 Date Mar. 25, 1980, § 102(e) Date Mar. 24, 1980, PCT Pub. No. WO80/00308, PCT Pub. Date Mar. 6, 1980

PCT Filed Jul. 24, 1979, Ser. No. 132,842

Claims priority, application Sweden, Jul. 25, 1978, 7808119

Int. Cl.³ G01L *5/02*

U.S. Cl. 73—379 **5 Claims**



1. A bench device for measuring muscular forces with static or dynamic opposing force providing means, comprising a base, a bunk having a back-rest adjustable therealong, said bunk being vertically adjustable on said base and longitudinally displaceable therealong, guiding means arranged at one end of said base below the plane of said bunk and substantially perpendicular to the longitudinal direction of the bunk, and at least one holder for static or dynamic opposing force providing means, which is horizontally displaceable along said guiding means between end positions on either side of said bunk, said holder and bunk thus being continuously adjustable relative to each other vertically as well as transversely and longitudinally to the bunk to render various measurements of muscular forces possible on a sitting as well as a lying person.

4,333,341

DETERMINATION OF THE ACCELERATION OF GRAVITY

Emanuel P. Manche, 33 Edwards La., Glen Cove, N.Y. 11542

Filed Jun. 9, 1980, Ser. No. 157,662

Int. Cl.³ G01V *7/14*

U.S. Cl. 73—382 R **3 Claims**

1. An apparatus for measuring the acceleration of gravity comprising:

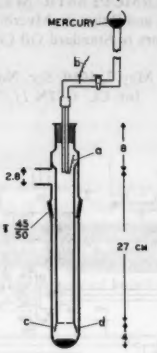
an elongated container, mounted with its longitudinal axis vertical, and having an opening in its top;

a capillary tube extending through the opening in the top and being vertically adjustable so that the distance between the end of the tube within the container and bottom of the container may be varied;

a reservoir containing mercury connected to the other end of the capillary tube by a conduit providing a pressure head at the other end of the capillary;

means for varying the pressure head;

means for sensing departure of a drop of mecury from the end of the tube within the container and sensing arrival of the drop at a fixed point a known distance from the end of the tube; and



means for measuring the time interval between the departure and arrival of the drop of mecury.

4,333,342

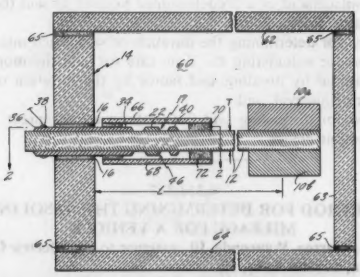
FLUID DAMPED SAW ACCELEROMETER

Meyer Gilden, West Hartford; Donald E. Cullen, Manchester, and Thomas W. Grudkowski, Glastonbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 3, 1980, Ser. No. 203,823

Int. Cl.³ G01P *15/08*

U.S. Cl. 73—516 R **5 Claims**



1. A damped, cantilevered mass accelerometer comprising:

a beam comprised of piezoelectric material rigidly disposed at a proximal end so as to form a cantilever and having an inertial mass disposed at the distal end thereof, a surface acoustic wave device formed on a first surface of said beam near said distal end, and circuit means for providing a signal indication of the acoustic velocity of a surface wave in said surface acoustic wave device;

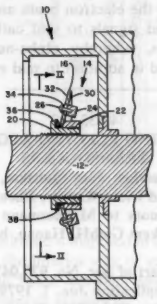
characterized by

said beam being disposed within an enclosed chamber including a damping fluid, said surface acoustic wave device being isolated from said damping fluid by a thin wall sealed to said beam so that said surface acoustic wave device is encapsulated between said beam and said wall.

4,333,343
CENTRIFUGALLY ACTUATED TRIP MECHANISM

Charles C. Czuszak, Greensburg, Pa., assignor to Elliott Turbomachinery Co., Inc., Jeannette, Pa.

Filed Oct. 27, 1980, Ser. No. 200,859
Int. Cl.³ G01P 3/16; G05D 13/04
U.S. Cl. 73—538 5 Claims

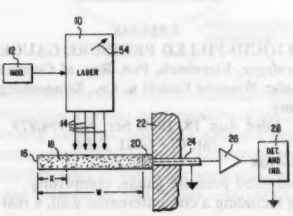


1. A trip mechanism for use with a rotatable shaft comprising:
a Belleville spring encircling the shaft;
collar means secured to the shaft for mounting the spring thereon and engaging the spring to transmit rotary motion from the shaft to the Belleville spring; and
a plurality of weights connected to the spring; wherein the spring includes
a reinforcing band portion annularly extending around the Belleville spring, the spring and weights being so proportioned that the spring will snap overcenter when the rotational speed of the shaft exceeds a preset value and will snap back overcenter toward an unstressed position when the rotational speed of the shaft is reduced.

4,333,344
SYSTEM AND METHOD FOR TESTING THE REACTION OF RARE EARTH IONS

Clyde A. Morrison, Wheaton, and Joseph P. Sattler, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 28, 1980, Ser. No. 200,832
Int. Cl.³ G01N 29/00
U.S. Cl. 73—584 9 Claims

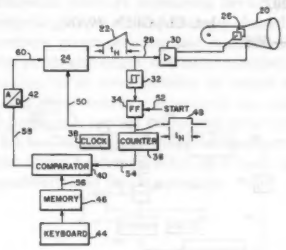


7. A method for indicating the excited state reactions of rare earth ions in a crystalline medium comprising the steps of:
forming a mechanical bar of the crystalline medium doped with rare earth ions, said bar having a mechanically resonant frequency,
exciting the bar with radiant energy near the excitation frequency of the ions in the bar and modulating said energy at the said mechanically resonant frequency, thereby to excite the rare-earth ions to provide non-radiative phonons which mechanically excite the bar at the said modulation frequency and thereby cause the bar to mechanically resonate,
piezoelectrically transferring a portion of the resonant energy to electrical energy, and
indicating the electrical energy thus transferred,
thereby providing indication of the excited state reactions of said ions.

4,333,345
DISPLAY OF ULTRASOUND TEST DATA

Peter Renzel, Düren, and Klaus Kroesen, Bonn, both of Fed. Rep. of Germany, assignors to Krautkramer-Branson, Inc., Stratford, Conn.

Filed Oct. 21, 1980, Ser. No. 199,244
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1979, 2945201
Int. Cl.³ G01N 29/04
U.S. Cl. 73—606 12 Claims



1. Apparatus for displaying an echo related signal, said signal resulting from the reflection of ultrasonic energy from within an object being examined, the display apparatus comprising:
means for transducing the echo related signals into an information containing voltage signal;
cathode ray tube;
sweep voltage generator means, said sweep voltage generator means producing a sawtooth voltage for time-dependent deflection of the electron beam of the cathode ray tube in a first direction, said sawtooth voltage having preselected minimum and maximum levels and a predetermined slope;
means for applying the sawtooth voltage provided by said sweep voltage generator means to a first pair of deflection plates of said cathode ray tube;
data entry means for generating signals commensurate with a desired examination field in the test object in units of length and for generating signals commensurate with those parameters of the test object and ultrasound energy source which effect the transmission time of the ultrasonic energy from the source to the beginning of the desired examination field, said data entry means also generating signals commensurate with the parameters of a region within the examination field;
microprocessor means, said microprocessor means including means for storing information commensurate with signals generated by said data entry means, said microprocessor means computing and storing the delay time commensurate with the ultrasound energy transmission time between the source of ultrasonic energy and the depth in the test object commensurate with the beginning of the region within the examination field, said microprocessor further computing and storing the time commensurate with the length in the direction of ultrasound energy travel in the workpiece of the said region within the imaging field;
means responsive to the information computed and stored by said microprocessor means for generating deflection signals for application to a second pair of deflection plates of

said cathode ray tube and for generating a cathode ray tube electron beam generating control signal;

means for selectively and alternately applying said information containing signals and said deflection signals generated in response to the information computed and stored by said microprocessor means to said cathode ray tube second pair of deflection plates; and

means for applying said electron beam gating control signal to said cathode ray tube simultaneously with the application of said computed deflection signal whereby the bounds of the region and the echo related signals may be displayed.

4,333,346

DISPLAY DEVICE FOR NON-DESTRUCTIVE TESTING APPARATUS

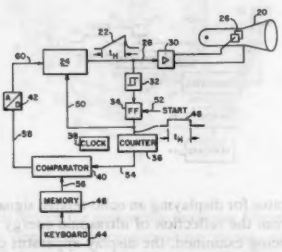
Peter Renzel, Düren, Fed. Rep. of Germany, assignor to Krautkramer-Branson, Inc., Stratford, Conn.

Filed Oct. 21, 1980, Ser. No. 199,246

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1979, 2945202

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—606 **8 Claims**



1. Apparatus for use in the display of the results of nondestructive testing with a beam of ultrasonic energy comprising:

a cathode ray tube;

means for applying signals commensurate with echoes received from within a workpiece to a first pair of deflection plates of said cathode ray tube;

adjustable sweep voltage generator means, said sweep voltage generator means providing an output voltage having a sawtooth wave form for the time-dependent deflection of the electron beam of said cathode ray tube, said sawtooth voltage having a defined amplitude range and a variable slope;

means for applying said sweep voltage output voltage to the second pair of deflection plates of said cathode ray tube;

data entry means for serially generating signals commensurate with a desired imaging region in the test object and with those parameters of the ultrasound beam generator and test object which effect the transmission time of the ultrasound beam from the ultrasound transducer to the onset of the imaging region;

microprocessor means, said microprocessor means including memory means for storing the information entered by means of said data entry means, said microprocessor means further comprising a computing circuit for computing a desired sawtooth voltage waveform slope commensurate with the desired imaging region and a trigger delay time commensurate with the travel time between emission of the ultrasonic signal and said signal arriving at the onset of the desired imaging region, said microprocessor means further storing information commensurate with messages corresponding to computed information and information provided from said data entry means;

writing circuit means connected to said microprocessor means memory means, said writing circuit means providing a first output signal commensurate with deflection and a second output signal commensurate with cathode ray tube electron beam intensity, said first and second output signals being commensurate with alpha-numeric information stored in said microprocessor means memory information stored in said microprocessor means memory means; and

means for selectively and simultaneously applying said writing circuit means intensity related signals to said cathode ray tube to gate the electron beam and for applying said deflection related signals to said cathode ray tube first deflection plates, whereby alpha-numeric information may be displayed in addition to said echo related signals.

4,333,347

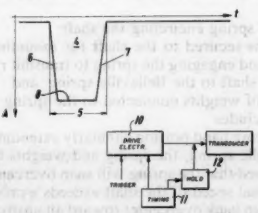
STIMULATING ELECTRO-ACOUSTICAL TRANSDUCERS

Raimund Lang, Wasserlos; Jörg Quittkat, Neuberg; Gert Fischer, Mülheim, and Dieter Lather, Rheurdt, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf and Nukem GmbH, Hanau, both of, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 927,047, Jul. 24, 1978, abandoned. This application Jun. 7, 1979, Ser. No. 46,541

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—642 **3 Claims**



1. Method of stimulating and energizing an electroacoustic transducer comprising the steps of producing an electrical signal with a definite rise time and as applied to the transducer;

holding the energizing level to a particular amplitude for a period so that the total pulse period is at least approximately equal to one or an odd multiple of half an oscillating period at a resonance frequency of the transducer; and

running the signal level back to a zero or reference level to be actively maintained thereafter for positively inhibiting the production of ultrasonic signals by the transducer following the steep traversing edge.

4,333,348

LIQUID-FILLED PRESSURE GAUGE

Helmut Berninger, Eisenbach, Fed. Rep. of Germany, assignor to Alexander Wiegand GmbH u. Co., Klingenberg, Fed. Rep. of Germany

Filed Aug. 18, 1978, Ser. No. 934,979

Int. Cl.² G01L *7/04*

U.S. Cl. 73—708 **6 Claims**

1. A liquid-filled pressure gauge, comprising

a housing including a circumferential wall, a rear wall and a front side,

a transparent face plate on the front side of said housing,

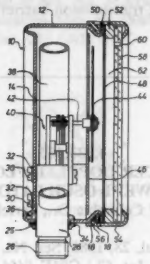
a metering element in the interior of said housing,

a metering element support one end of which projects out of the housing on the other end of which projects into the interior of said housing and supports the metering element at one end,

a pointer train having a pointer which is articulately connected to the other end of said metering element and whose pointer position can be observed or viewed through the face plate,

wherein the face plate consists of a stiff material,

wherein an elastic membrane of transparent material which seals off the front side of the housing is located on the side of said face plate which faces the interior of said housing,



wherein the membrane is disposed in at least partially spaced relation from the interior side of said face plate

and wherein the space between said face plate and said membrane is vented externally.

4,333,349

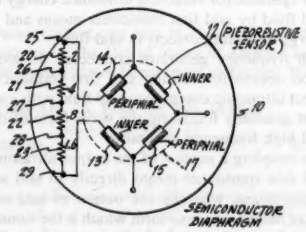
BINARY BALANCING APPARATUS FOR SEMICONDUCTOR TRANSDUCER STRUCTURES

Joseph R. Mallon, Franklin Lakes, and Anthony D. Kurtz, Englewood, both of N.J., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Filed Oct. 6, 1980, Ser. No. 194,034

Int. Cl.³ G01L *19/04*

U.S. Cl. 73—708 **19 Claims**



5. In an integrated semiconductor transducer arrangement of the type employing a bridge configuration of integrated piezoresistive sensing elements, with said elements deposited on a semiconductor substrate by an integrated circuit technique, the combination therewith of balancing apparatus for providing a zero shift and balance for said bridge configuration, comprising:

a binary resistive ladder comprising a plurality of resistors, each one differing in value from each other by a factor of two and arranged in series with at least one section of said bridge, and means for selectively bypassing desired ones of said resistors according to an output from said transducer upon application thereto of a zero reference pressure, said resistive ladder deposited on said diaphragm according to the same technique as employed for deposition of said piezoresistors.

4,333,350

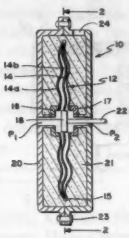
DIFFERENTIAL PRESSURE SENSING DEVICE

James M. Gibb, 15 Etive Dr., Airdrie, Scotland

Filed May 1, 1980, Ser. No. 145,396

Int. Cl.³ G01L *7/08*

U.S. Cl. 73—715 **5 Claims**



1. A differential pressure measuring device comprising, a capsule comprising three correspondingly shaped side by side flexible members, means securing said members to each other at their outer peripheral edges, said outer members providing a limiting position for an inner member, an output member connected to said inner member to provide an output when a differential pressure is applied across said inner member, housing means for said capsule, and a liquid filling surrounding said capsule, said filling hardening when said outer members are held in a predetermined limiting position.

4,333,351

METHOD AND APPARATUS FOR MEASURING THE RESIDUAL TENSION IN A STUD OR A BOLT

John H. Bickford, Middletown, Conn., assignor to Raymond Engineering Inc., Middletown, Conn.

Filed Feb. 25, 1980, Ser. No. 124,301

Int. Cl.³ F16B *31/02*

U.S. Cl. 73—761 **6 Claims**

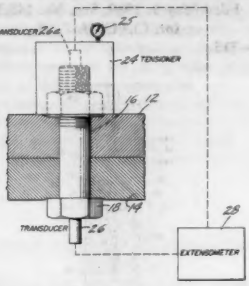
1. A method for determining the residual tension in a fastener, the method including the steps of:

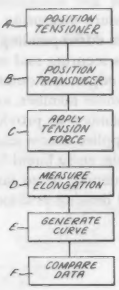
applying increasing tension forces to a fastener to elongate the fastener;

determining the elongation of the fastener for various tension forces;

generating a force-strain curve data to relate the increasing

force applied to the fastener to the elongation of the fastener; and





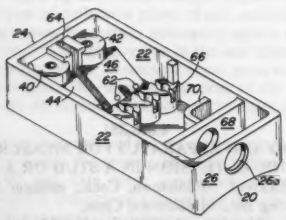
determining the residual preload of the fastener as a function of the initial slope of the generated force-strain curve data.

4,333,352

INJECTION-MOLDED DOPPLER FLOWMETER TRANSDUCER ASSEMBLY

James G. Connery, Ambler; Dominick D. Diascro, Philadelphia; Louis D. DiNapoli, Colmar; Giancarlo Punis, Chalfont, and Anthony J. Matour, Harleysville, all of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed Oct. 14, 1980, Ser. No. 197,059
Int. Cl.³ G01F 1/66
U.S. Cl. 73—861.18 **14 Claims**



1. A preformed transducer housing for an ultrasonic flowmeter for mounting on the outer surface of a cylindrical pipe comprising:

a base member having a semi-cylindrical concave surface for engagement with said surface of said pipe;

side walls and end walls carried by said base member upstanding away from said semi-cylindrical surface to form an enclosure;

pedestal means integral with said base member located within said enclosure, said pedestal means having an exposed flat face, the plane of said face forming an acute angle with the axis of said semi-cylindrical surface, and

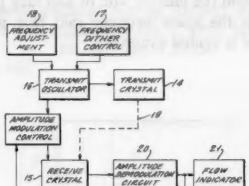
acoustic transmission barrier means in said pedestal means for dividing said exposed flat face into two areas separated by said acoustic transmission barrier means.

4,333,353

TWO-TRANSDUCER DOPPLER FLOWMETER WITH SWEPT OSCILLATOR

Joseph Baumoel, 107 Columbia Dr., Jericho, Long Island, N.Y. 11753

Filed Jul. 28, 1980, Ser. No. 173,012
Int. Cl.³ G01F 1/66
U.S. Cl. 73—861.25 **10 Claims**



1. A doppler flowmeter measuring system for measuring the flow of a fluid in a conduit comprising:

first transducer means connected to a first portion of said conduit and operable for injecting ultrasonic energy into said fluid;

second transducer means separate from said first transducer means and connected to a second portion of said conduit and operable for receiving ultrasonic energy injected into said fluid by said first transducer means and reflected by energy reflecting objects in said fluid;

a high frequency generator connected to said first transducer means for causing said first transducer means to inject ultrasonic energy into said fluid with a wave form at least generally following the wave form of the output of said high frequency generator;

means coupling a portion of the output ultrasonic energy of said first transducer means directly to said second transducer means, whereby the output of said second transducer means is a wave form which is the summation of the wave form of ultrasonic energy received directly from said first transducer means and the ultrasonic energy reflected from reflecting objects in said fluid;

amplitude demodulation means connected to said second transducer means for demodulating the beat frequency content in the ouptut of said second transducer means and for producing an output signal related to said beat frequency;

said wave form of ultrasonic energy injected into said fluid by said first transducer means containing a relatively low frequency cyclic dither; said relatively low frequency cyclic dither having a cyclic frequency which is relatively high in comparison to the highest beat frequency which is to be produced by said measuring system; and

means for modulating the ratio of the amplitudes of the signals received by said second transducer means from said energy reflecting objects and directly from said first transducer means respectively.

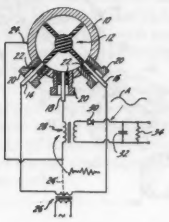
4,333,354
LIQUID FLOW SENSORS

Murray F. Feller, Citrus County, Fla., assignor to Wilgood Corporation, Jacksonville, Fla.

Continuation-in-part of Ser. No. 31,416, Apr. 19, 1979, abandoned. This application May 15, 1980, Ser. No. 150,142

Int. Cl.³ G01F *1/10*

U.S. Cl. 73—861.77 **12 Claims**



1. A liquid flow sensor for water or similar liquid having some electrical conductivity, including a rotor adapted to be rotated about its axis by flowing liquid and having vanes of much higher resistivity than that of the liquid, means for supporting the rotor within a wall defining a liquid flow passage whereby rotation of the rotor may be calibrated in terms of liquid flow within the wall, and an electric circuit for producing signals representing the flow of the liquid, said circuit including plural excitation and sensing electrodes at least two of which are disposed in proximity to the path of said vanes, said electrodes being exposed to the liquid and said two electrodes acting in the absence of said rotor, to form a pattern of paths of current therebetween, said vanes being movable successively into a position clear of substantial current paths between said two electrodes and into positions wherein a substantial portion of said pattern of paths would extend through the thickness of said vanes but is suppressed thereby.

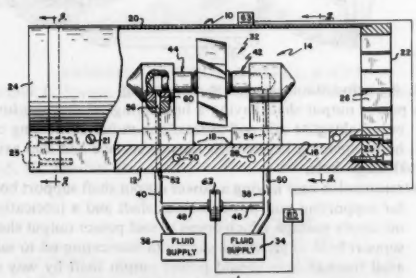
4,333,355
PRESSURE BALANCED DRAG TURBINE MASS FLOW METER

Michael W. Dacus, Gilbert, and Jack H. Cole, Fayetteville, both of Ark., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 23, 1980, Ser. No. 143,058

Int. Cl.³ G01F *1/10*

U.S. Cl. 73—861.91 **6 Claims**



1. In a device for measuring the density and velocity of a fluid flowing through a tubular member, which comprises a rotor assembly axially disposed within the tubular member, said rotor assembly supported to allow rotation about and translation along the tubular member axis, the rotor assembly consisting of a plurality of blades mounted upon a shaft, a fluid bearing means for suspending the rotor assembly shaft within the tubular member whereby the sliding friction between the rotor shaft and a bearing surface is eliminated, and a means for measurement of rotor blade velocity, the improvement comprising,

means for establishing independent constant fluid flow to upstream and downstream fluid bearings whereby a pressure balance is attained between the upstream and downstream sides of the rotor shaft, and

detection means for monitoring a fluid pressure differential between the upstream and downstream bearings of the rotor shaft, said pressure differential arising from rotor shaft displacement during fluid flow in either direction in the tubular member.

4,333,356
MIXING APPARATUS

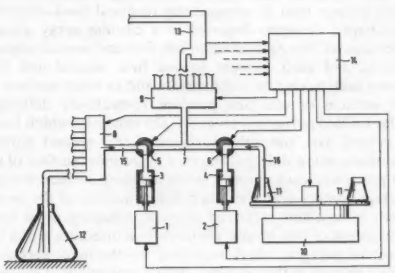
Hermann Bartels, Binningen; Hans-Christian Mez, Basel; Walter Huber, Riehen, and Hans-Peter Stolz, Pratteln, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 15, 1980, Ser. No. 140,536

Claims priority, application Switzerland, Apr. 27, 1979, 3992/79

Int. Cl.³ G01N *35/08*

U.S. Cl. 73—864.21 **11 Claims**



1. In a mixing apparatus for producing a liquid having a plurality of components mixed in a selected ratio which comprises flow means for receiving the respective components, and a plurality of metering pumps for the respective components connected to said flow means and operable to cause delivery thereto of the components, each pump having a respective stepping motor as a drive motor and comprising a piston burette, the piston of which is driven by said stepping motor to sweep a predetermined increment of volume in response to each step of the stepping motor,

the improvement comprising an automatic control means connected to the pump motors to control same and being operable to supply individual control signals thereto as respective trains of pulses, said control means having input means for receiving input data determining the selected mixing ratio and including computer means (a) being responsive to such input data to compute and establish the pulse interval for each pulse train such that the pumps cause quantities of the respective components to be delivered to said flow means in the same period of time in accord with said selected ratio and at a respective uniform rate during said period and (b) being arranged to compute initial piston positions for the burettes in accord with the quantities of the respective components to be delivered to the flow means in accord with said selected ratio; and said automatic control means further including an interface device connected to each stepping motor and responsive to commands generated by the computer means to supply pulses to the associated stepping motor to establish the

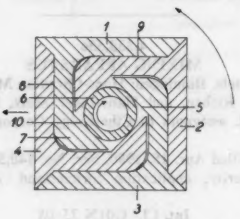
initial position of the associated burette piston and to subsequently control the supply of the train of pulses to the stepping motor to cause delivery of the associated component to said flow means.

4,333,357

EXPANSION ELEMENT

Knud Vinther, M-o-llegardsparken 4, DK-8355 Ny Solbjerg, Denmark

Filed Jun. 6, 1980, Ser. No. 157,924
Int. Cl.³ F16H *21/44, 25/18*
U.S. Cl. 74—110 **9 Claims**



1. An expansion mechanism comprising n (where n is an integer greater than 2) substantially identical hook-shaped or spiral-shaped elements disposed in a circular array about a central axis so that each element has first and second adjacent elements, and each element having first, second and third portions each having an inner surface and an outer surface, the inner surfaces of said first portions respectively defining a regular n-sided polygonal chamber, the center of which lies on said central axis, the outer surfaces of said second portions respectively being sliding surfaces, and the inner surface of said third portion of each element being a sliding surface which is in sliding contact with the outer sliding surface of the second portion of said first adjacent element, whereby upon linear displacement of one of said elements in a direction along that side of the polygon which is defined by the inner surface of said first portion of that element, sliding movement of the outer surface of the second portion of that element along the inner surface of the third portion of the second adjacent element, and of the inner surface of the third portion of that element along the outer surface of the first adjacent element, causes said adjacent elements to be displaced correspondingly, between a first condition in which the outer surfaces of the third portions respectively are relatively close to said central axis and a second condition in which the outer surfaces of the third portions respectively are relatively distant from said central axis.

4,333,358

POWER-SHIFT COUNTERSHAFT TYPE TRANSMISSION

Giorgio P. Grattapaglia, Turin, Italy, assignor to Fiat-Allis Macchine Movimento Terra S.p.A., Stupinigi, Italy

Filed Jul. 16, 1980, Ser. No. 169,406
Claims priority, application Italy, Dec. 18, 1979, 69433 A/79
Int. Cl.³ F16H *3/08, 57/02*
U.S. Cl. 74—359 **9 Claims**

1. A power-shift countershaft type transmission comprising:

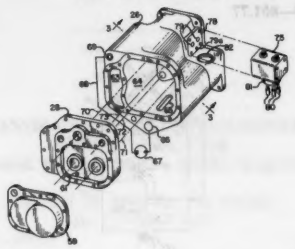
a transmission housing having a first end wall and a second end wall which is releasably secured to said housing in spaced relationship to said first end wall,

said first and second end walls each having aligned bearing bores therein for rotatably supporting power transmission means,

a dividing wall formed within said housing in a position between said first and second end wall to form a main rotating components compartment and a sump compartment,

power transmission means rotatably supported by said first and second end wall bearing bores providing forward, reverse, and change-speed transmission of power,

control means operatively connected to said transmission for selectively controlling the transmission of power from said power transmission means, and



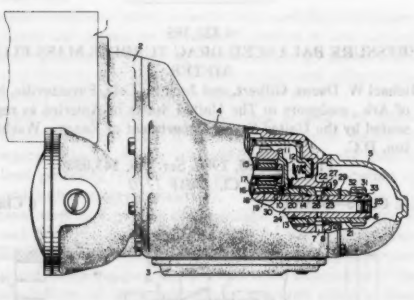
fluid transfer means coupled between said main rotating components compartment and said sump compartment, for transferring fluid therebetween to operate said power transmission means in a substantially splash-free environment.

4,333,359

LUBRICATING OIL TRANSFER CONSTRUCTION IN AN AUTOMATIC TRANSMISSION FOR VEHICLES

Yutaka Taga, and Kunio Morisawa, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 24, 1980, Ser. No. 143,361
Claims priority, application Japan, Jun. 27, 1979, 54-81109
Int. Cl.³ F16H *57/04*
U.S. Cl. 74—467 **4 Claims**



1. An automatic transmission comprising:

a power output shaft having a lubricating oil through hole bored along its axis and at least one radial lubricating oil hole extending between its outside surface and said axial through hole,

a transmission case having a power output shaft support hole for supporting said power output shaft and a lubricating oil supply passage which opens to said power output shaft support hole to provide a supply of lubricating oil to said axial through hole in said power output shaft by way of said radial lubricating oil hole in said power output shaft, said power output shaft support hole including a first portion which serves as a radial bearing portion for rotationally supporting said power output shaft and a second portion which is located axially adjacent to and coaxial with said first portion and serves as an annular sealing surface, said power output shaft having a construction permitting its assembly into said power output shaft sup-

port hole from the side of said first portion of said support hole,

a lubricating oil transfer mechanism comprising a power output shaft sleeve of a generally tubular shape and having a construction permitting it to be fitted closely over said power output shaft from the side of said second portion of said support hole so as to integrally rotate with said power output shaft but not to engage in any rotational power transmission, said power output shaft sleeve providing an oil communications passage between said lubricating oil supply passage in said case and said radial lubricating oil hole in said power output shaft, said power output shaft sleeve being formed with a circumferential groove in the outside surface thereof, and,

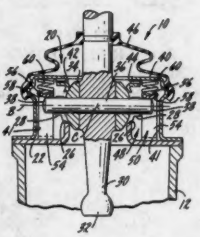
a lubricating oil seal ring provided between said second portion of said support hole and said power output shaft sleeve and received in said circumferential groove, for intercepting leakage of lubricating oil through an annular space in the power output shaft support hole surrounding said power output shaft.

4,333,360

TRANSMISSION SHIFT CONTROL APPARATUS

John P. Simmons, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jul. 3, 1980, Ser. No. 165,895
Int. Cl.³ G05G 9/12; F16C 11/06
U.S. Cl. 74—473 P **11 Claims**



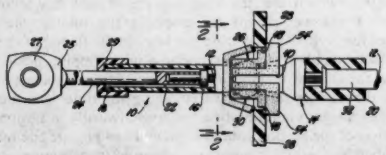
1. Shift control apparatus comprising a housing defining a seat having at least one slot, a shift lever including a pivot element in said seat and a pin extending through each slot, and biasing means including at least one biasing mechanism, each biasing mechanism including a saddle riding on said pin and extending therefrom with a pair of base portions contiguous to said housing, and resilient means including a pair of springs respectively biasing said base portions toward contact with said housing.

4,333,361

REMOTE CONTROL (SWIVEL JOINT)

Arthur L. Spease, Livonia, Mich., assignor to Teleflex Incorporated, Limerick, Pa.

Filed Apr. 25, 1980, Ser. No. 143,902
Int. Cl.³ F16C 1/10
U.S. Cl. 74—501 P **10 Claims**



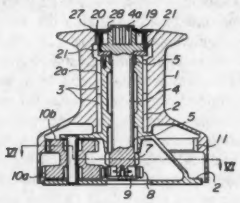
1. A motion transmitting remote control assembly (10) of the type for transmitting motion in a curved path by a flexible motion transmitting core element (12), said assembly (10) comprising: a motion transmitting core element (12); guide means (14) for movably supporting said core element (12), said guide means (14) including a rigid end fitting (16) having first and second ends (18, 20) with a bore (22) therethrough and between said ends (18, 20), said core element (12) including a rigid bar (24) extending from said first end (18) of said end fitting (16) and supported for reciprocating movement in said bore (22) of said end fitting (16); support means (26) for supporting said end fitting (16) in a support structure (28); and characterized by swivel joint means (30) interconnecting said support means (26) and said end fitting (16) at an intermediate position spaced from both of said first and second ends (18, 20) for allowing pivotal movement of said end fitting (16) and said bar (24) about said swivel joint means (30) while at the same time allowing movement of said bar (24) in said end fitting (16) and through said swivel joint means (30), said guide means (14) including a flexible conduit (32) attached to and extending from said second end (20) of said end fitting (16).

4,333,362

SPEED-SHIFT APPARATUS FOR SHEET WINCH

Masumi Sugioka, Shimada, and Norihiro Ogawa, Shizuoka, both of Japan, assignors to Asahi Malleble Iron Co., Ltd., Shizuoka, Japan

Filed May 23, 1980, Ser. No. 152,882
Claims priority, application Japan, May 31, 1979, 54-67898
Int. Cl.³ F16H 5/52
U.S. Cl. 74—812 **5 Claims**



1. A speed-shift apparatus for a sheet winch with multiple speed-change ratio comprising

a base;

a drum rotatably supported by a bearing roller disposed between said drum and base;

an input shaft rotatably fitted in said base;

a driving gear secured to a lower portion of said input shaft and a further driving gear operatively connected to the lower end of said input shaft through a one-way clutch mechanism;

a planet gear supported by a side shaft and meshed with said driving gear and an internal gear formed on the inner peripheral surface of the lower end of said drum;

a first intermediate gear meshed with said driving gear and a second intermediate gear coaxially connected to said first intermediate gear meshed with said further driving gear;

a one-way rotation transmitting mechanism having a plurality of pawl means pivotally secured to said input shaft and a pawl-engaging groove means formed on the surface of said winch drum which faces said pawl means so as to allow the drum a one-way rotation by their engaging;

an interrupting member having pawl-engaging portions and being disposed between said drum and said input shaft and being rotatably supported on the top surface of said base and adapted to partially interrupt a space between said pawl means and said pawl-engaging groove means; and

a mechanism allowing one-way rotation of said interrupting member relative to a base of said sheet winch, said mechanism including sawteeth formed on the lower bottom surface of said interrupting member and a resiliently bi-

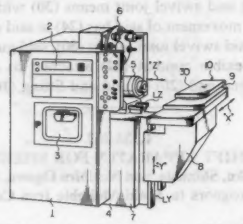
ased pin means extending from said base so as to engage said sawteeth.

4,333,363

INDEX TABLE ASSEMBLY

Seiuemon Inaba; Tokiji Shimajiri, both of Kawasaki, and Kenichi Toyoda, Hino, all of Japan, assignors to A. Aoki & Associates, Tokyo, Japan

Continuation of Ser. No. 863,346, Dec. 22, 1977, abandoned.
This application Jun. 18, 1980, Ser. No. 160,525
Claims priority, application Japan, Dec. 29, 1976, 51-160626
Int. Cl.[3] B23Q *17/00*
U.S. Cl. 74—826 5 Claims



1. An indexing table assembly adapted to be mounted on a machine tool or other industrial machine, comprising first and second screw elements coaxially engaged with each other and mounted for movement along their axes, means for moving said first screw element along its axis, a turntable connected to said second screw element and movable therewith, means for preventing said second screw element from being moved beyond a predetermined range, said means for moving said first screw element comprising a cylindrical piston directly connected to said first screw element, a circular fluid chamber in which said cylindrical piston is mounted for movement, said cylindrical piston separating said chamber into first and second chambers, a source of pressurized fluid, a control valve for controlling the flow of pressurized fluid into either said first chamber or said second chamber with the result that when the pressurized fluid flows into said second chamber the first screw element is moved positively in one direction, and then when the pressurized fluid flows into said first chamber said first screw element is moved positively in the other direction, a turntable operated control circuit for said control valve, and cam and valve means for effecting a dampening action of the fluid in said first chamber during indexing operation of the assembly, said cam being connected to said second screw element.

4,333,364

METHOD FOR MANUFACTURING A ROTARY DRILL BIT HAVING A SOLID FORGED, UNITARY BODY

Daniel W. Varel, Dallas, Tex., assignor to Varel Manufacturing Company, Dallas, Tex.

Filed Apr. 7, 1980, Ser. No. 138,079
Int. Cl.[3] B21K *5/02;* E21B *9/08*
U.S. Cl. 76—108 A 5 Claims

1. A method for manufacturing a rotary earth boring bit for use on a rotating drill string, said method comprising the following steps:

forging a unitary body for rotating on an axis of rotation including an upper portion and a lower portion;

machining three hemi-cylindrical body surfaces on the lower portion of said body spaced at 120° intervals around said body;

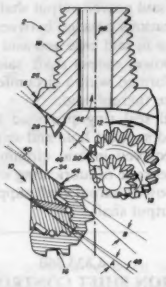
forging three cutter bases;

machining a cylindrical bearing pin having a center axis of symmetry on each of said bases;

machining a base surface on each of said bases to mate with one of said body surfaces;

machining a shoulder on said base disposed adjacent said base surface and adjacent the bearing pin;

machining an annular recess in each of the body surfaces and positioned to receive the shoulder of a cutter base;



rotatably mounting a cutter on said bearing pin; and

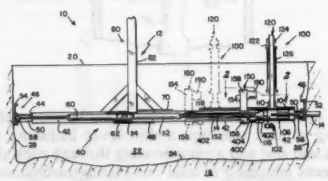
electron beam welding each of said base surfaces to one of said body surfaces said cutter bases being oriented with said bearing pins extending inwardly with respect to the bit.

4,333,365

POWER PIPE TONGS

Robert G. Perry, 3000 Ashwood Dr., Evansville, Ind. 47711

Filed May 9, 1980, Ser. No. 148,195
Int. Cl.[3] B25B *17/00*
U.S. Cl. 81—57.16 17 Claims



1. A power-driven apparatus for rotating a tubular member, comprising a housing, a first rotatable member including a hollow generally cylindrical-shaped portion for receiving the tubular member and a radially outwardly projecting flange in proximity to one end thereof, mounting means secured to the housing and including bearings for rotatably supporting the first rotatable member, a second rotatable member rotatably carried on the first rotatable member between the flange of the first rotatable member and the mounting means so that the second rotatable member is rotatable about the first rotatable member, the second rotatable member including bearings positioned in tandem with the bearings of the mounting means, at most two jaws, each having an arcuate outer surface and an arcuate inner surface, the inner surface of each jaw including upper and lower means for gripping the tubular member, means for pivotally mounting the jaws to the flange of the first rotatable member, the jaws having a non-gripping position to allow the tubular member to pass therebetween, means on the second rotatable member for engaging the outer arcuate surfaces of the jaws and pivoting the jaws inwardly in response to rotation of the second rotatable member to engage the tubular member in a gripping position, a bidirectional power means, coupling means between the power means and the second rotatable member for rotating the second rotatable member in first and second directions, the inner and outer arcuate surfaces

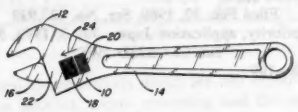
of the jaws providing flared jaw ends for restricting movement of the engaging means along the outer surfaces when the gripping means engage the tubular member, and biasing means interconnecting first adjacent ends of the jaws and interconnecting second adjacent ends of the jaws for biasing the jaws toward the non-gripping position.

4,333,366

CRESCENT WRENCH OPERATING INDICATOR

Carl R. Hurtig, Cohasset, Mass., assignor to Encor Limited, Cohasset, Mass.

Filed Mar. 21, 1980, Ser. No. 132,616
Int. Cl.³ B25B *13/16*
U.S. Cl. 81—170 **4 Claims**



1. In an adjustable wrench including a body, a handle, and a pair of jaws, at least one of which is movable toward and away from the other jaw, and a rotatable adjustment screw manually operable to cause jaw opening and closing, the improvement comprising:

a first tactual relatively roughened surface area disposed on at least one side of the wrench body closely adjacent one radial edge of said adjustment screw;

a second tactual relatively smooth surface area, tactually distinguishable from the first surface area, and being disposed on at least said one side of the wrench body closely adjacent another radial edge of said adjustment screw opposite said one radial edge; and

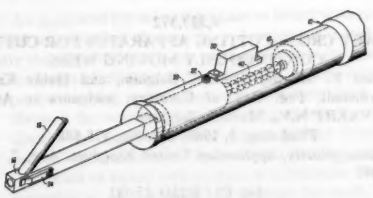
the rough to smooth surface area transition direction across the adjustment screw indicating the direction of rotation of the adjustment screw to cause intended jaw movement in one direction.

4,333,367

FEED CONTROL SYSTEM FOR AUTOMATIC FASTENER DRIVERS

Brenda W. Taffer, P.O. Box 335, Conover, N.C. 28613

Filed Jun. 23, 1980, Ser. No. 162,170
Int. Cl.³ B25B *23/04*
U.S. Cl. 81—430 **9 Claims**



1. A feed control apparatus for pneumatic fastener driving machines of the type in which a housing supports an air motor and a movable barrel which supports the fastener until driven by the motor through a drive bit, and in which a throttle valve is activated responsive to relative movement of the barrel with respect to the air motor to introduce air under pressure through a first input to the air motor or drive mechanism, and fasteners from a feed mechanism are pneumatically delivered to a receiving chamber in the barrel at the end of each driving operation; said feed control apparatus comprising:

(a) said housing carrying said throttle valve, air motor and barrel, said barrel including said receiving chamber therein and slidably received within said housing between three distinct positions, a ready position in which the fastener is seated with respect to said drive bit and engaged thereby, a driving position in which said barrel is moved rearwardly from said first position, and a fastener receiving position in which said barrel is urged forwardly of said first position to provide clearance for the entry of a new fastener;

(b) an electrical switching means mounted in said housing in the path of movement of said barrel and engaged thereby for detecting the barrel position at any one of said distinct positions and for causing a changed electrical condition responsive to movement of said barrel to any one of said three positions;

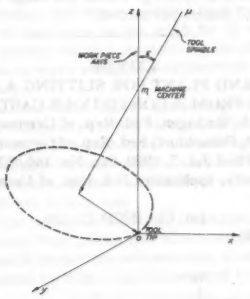
(c) an electrical control circuit connecting said drive mechanism and said feed mechanism, said circuit including said switching means for automatically initiating movement of said barrel to said third position and delivery of a new fastener from said feed mechanism to the chamber responsive to the movement of said barrel from said drive position back to said ready position.

4,333,368

METHOD AND APPARATUS FOR GENERATING ASPHERICAL SURFACES OF REVOLUTION

Gordon J. Watt, Fairfield, Conn., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Jul. 15, 1980, Ser. No. 169,072
Int. Cl.³ B23B *3/00, 3/28*
U.S. Cl. 82—1 C **10 Claims**



1. A method of cutting a desired aspherical surface of revolution on a work piece continuously rotatable about a vertical work spindle axis and engageable by a single-point cutting tip radially displaced from a tool spindle axis, said cutting tip being turnable about said tool spindle axis to describe a circular arcuate path in space, said method comprising:

(a) orienting the tool spindle axis relative to the work spindle axis so that the two spindle axes intersect at a given angle to define a machine center directly above said cutting tip when said cutting tip is at the lowest point in its circular arcuate path;

(b) continuously rotating the work piece about said work spindle axis;

(c) engaging said work piece by said cutting tip; and

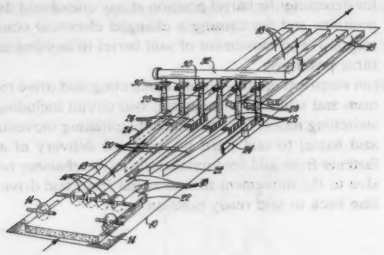
(d) turning said cutting tip about said tool spindle axis while displacing said machine center to follow the locus of the center of curvature of said desired aspherical surface at said cutting tip.

4,333,369

APPARATUS AND METHOD FOR DIVIDING FIBROUS MINERAL BLANKETS

Ralph E. McCort, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 16, 1980, Ser. No. 216,748
Int. Cl.³ B26D 7/18
U.S. Cl. 83—24 11 Claims



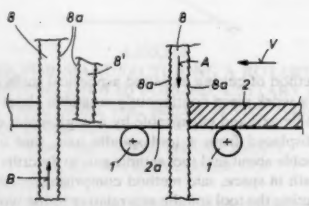
9. Apparatus for dividing a fibrous mineral blanket of the type in which a fibrous mineral blanket is passed into contact with means for slitting the blanket into batts and subsequently passed into contact with means for separating said batts from each other, wherein the improvement comprises suction chambers having one or more vertical openings having a height-to-width ratio of about 10 and being adapted for contact with the side edges of said batts, vacuum pipes extending into said chambers for educting air and airborne particles from said chambers and said side edges of said batts, said vacuum pipes having their eduction openings positioned within the bottom 25 percent of said chambers, and blast gates for establishing a velocity across said openings within the range of from about 5.0 to about 8.3 meters per second.

4,333,370

METHOD AND PLANT FOR SLITTING A HOT SLAB EMERGING FROM A CONTINUOUS CASTING PLANT

Ernst Th. Sack, Ratingen, Fed. Rep. of Germany, assignor to Sack GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 7, 1980, Ser. No. 166,452
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1980, 2927944
Int. Cl.³ B22D 11/126
U.S. Cl. 83—56 12 Claims



1. A method for slitting a hot slab emerging from a continuous casting plant advancing on a roller table comprising the steps of:

(a) providing a plurality of band saw means, each having a saw blade;

(b) serially positioning said blade of each of said band saw means one behind the next in a single cutting path, the first blade in the direction of said emerging slab being the leading blade, and the blades positioned therebehind being succeeding blades;

(c) advancing the emerging slab;

(d) cutting the advancing slab with the leading blade of the serially positioned blades;

(e) providing means on each blade for removing said leading blade in the series when said leading blade breaks;

(f) continuing to advance the slab when said leading blade breaks; and

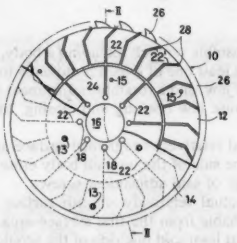
(g) cutting said advancing slab with said succeeding saw blade.

4,333,371

SAW BLADES HAVING COOLANT PASSAGES AND APPARATUS FOR USING THE BLADES

Eiji Matsuda, Kyoto, Japan, assignor to Tani Saw Mfg. Co., Ltd., Osaka, Japan

Filed Feb. 20, 1980, Ser. No. 122,922
Claims priority, application Japan, Jul. 3, 1979, 54-27047
Int. Cl.³ B23D 59/02
U.S. Cl. 83—169 3 Claims



1. A circular saw blade having two toothed blade members immovably coupled together, said blade comprising:

a plurality of coolant passages grooved on at least one inside surface of one of said blade members;

a plurality of inlet ports in an outside surface of said blade;

a plurality of release ports, there being a release port at the root peripheral side of each tooth cutting edge;

said coolant passages including radially directed first portions communicating with said inlet ports; and,

said coolant passages including second portions terminating at said release ports for directing a coolant toward said cutting edges to cool said cutting edges and remove cut work material therefrom.

4,333,372

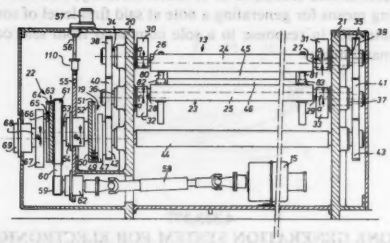
ROTARY CROSS-CUTTING APPARATUS FOR CUTTING CONTINUOUSLY MOVING WEBS

Wilfried E. Muylle, Schoten, Belgium, and Heinz Kreiter, Darmstadt, Fed. Rep. of Germany, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Aug. 5, 1980, Ser. No. 175,588
Claims priority, application United Kingdom, Aug. 7, 1979, 7927497
Int. Cl.³ B23D 25/00
U.S. Cl. 83—324 8 Claims

1. A rotary cross-cutting apparatus for cutting a continuously moving web into adjustable predetermined lengths, said apparatus comprising a web cutter which is mounted for cyclical movement towards and away from the web path, feed means for feeding the web to said web cutter, motor means for driving said web cutter and said feed means, a driving shaft which is adapted to be driven at constant speed by said motor means and which is coupled to said cutter via a speed controller causing acceleration and deceleration of said cutter in each cycle, compensating means including a compensating flywheel which serves to compensate for the fluctuating loading of the driving shaft due to the acceleration and deceleration of said cutter, the driving shaft being coupled to the web cutter on the

one hand and to the compensating means flywheel on the other hand by first and second crank arm mechanisms respectively, which have a common input rotation axis and separate output rotation axes offset from said input rotation axis by an eccen-



tricity e_1 and e_2 respectively which are 180° out-of-phase relative to one another, means mounting said driving shaft for parallel bodily displacement transversely of its axis, and means for adjusting the bodily position of said driving shaft to vary the eccentricities e_1 and e_2.

4,333,373

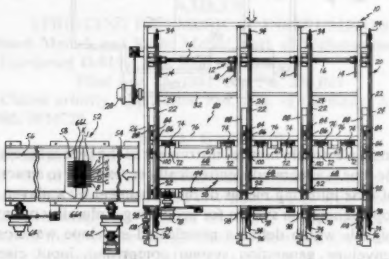
POSITIONING AND FEED SYSTEM FOR CANTS AND BOARDS

Charles Blickenderfer, Puyallup, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Sep. 30, 1980, Ser. No. 192,278

Int. Cl.³ B27B 5/00; B26D 7/06

U.S. Cl. 83—419 **11 Claims**



1. An apparatus for orienting a cant or board with respect to at least one cutting element in a downstream work station where the cants or boards are moved transversely into a position for longitudinal feeding into the work station, comprising:

a pre-positioning station spaced transversely from a plane through the work station and having at least two longitudinally spaced independent vertically and transversely movable pins associated therewith for skewing and orienting a cant or board with respect to a reference line corresponding to a reference plane through the work station,

a final positioning and feed station transversely spaced from the pre-positioning station and approximately in line with and upstream from the work station, having at least two longitudinally spaced independent vertically and transversely movable pins associated therewith and having means to move each pin transversely substantially the same distance as the corresponding pin in the pre-positioning station, and

means associated with the final positioning and feed station for accepting the pre-positioned cant or board after its transverse movement has stopped and conveying it longitudinally in its pre-positioned orientation through the work station.

4,333,374

SUBMULTIPLE-RELATED-FREQUENCY WAVE GENERATOR

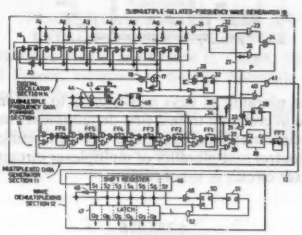
Takatoshi Okumura; Akira Nakada; Yasuji Uchiyama; Eiichiro Aoki; Eiichi Yamaga, and Akiyoshi Oya, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Division of Ser. No. 915,239, Jun. 13, 1978, Pat. No. 4,228,403. This application Mar. 24, 1980, Ser. No. 133,601

Claims priority, application Japan, Jun. 17, 1977, 52-71822; Sep. 1, 1977, 52-105105

Int. Cl.³ G10H 5/06

U.S. Cl. 84—1.01 **15 Claims**



1. A submultiple-related frequency wave generator useful in an electronic musical instrument, comprising:

a digital oscillator means for producing basic pulses which occur at a repetitive rate corresponding to a specific frequency,

submultiple frequency data forming means, cooperating with said digital oscillator means and receiving said basic pulses, for transmitting upon each occurrence of said basic pulse, a serial data signal consisting of said basic pulse and a binary number having a certain number of bits, and form incrementing said binary number upon repetitive occurrences of said basic pulses, each bit in said transmitted binary number thereby representing the state of a respective square wave which is a submultiple of said specific frequency,

said digital oscillator means producing basic pulses at a specific frequency which corresponds to a particular musical note in a high octave, each represented square wave thereby corresponding to a musical note of the same note name as said particular musical note but in a respectively lower octave, and

musical tone production means, connected to receive said transmitted basic pulses and binary numbers, for producing musical tones from selected ones of said square waves represented by bits of said transmitted binary numbers.

4,333,375

ELECTRONIC MUSICAL INSTRUMENT HAVING TIME MULTIPLEXED KEYING SYSTEM

Kiyoshi Sogoh, Hamamatsu, Japan, assignor to Nihon-Hammond Kabushiki Kaisha, Osaka, Japan

Filed Apr. 28, 1980, Ser. No. 144,070

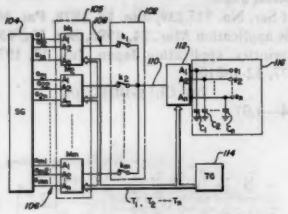
Claims priority, application Japan, May 2, 1979, 54-54338; Nov. 14, 1979, 54-54336; Nov. 14, 1979, 54-54337; Nov. 14, 1979, 54-86319

Int. Cl.³ G10H 1/00

U.S. Cl. 84—1.01 **8 Claims**

1. A synthesis electronic organ having a signal generator for generating a multiplicity of tone signals corresponding to the fundamentals and desired harmonics of notes to be synthesized, at least one keyboard having a plurality of single contact keys and a time division multiplexed keying system, said keying system comprising: a plurality of time division multiplexer circuits corresponding in number to said plurality of keys, each of said multiplexer circuits having a plurality of input terminals

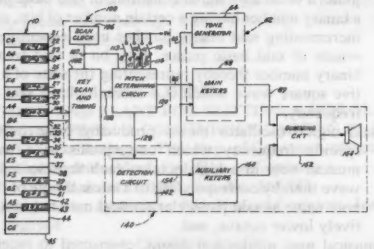
connected to receive selected ones of said tone signals and an output terminal; a first time division demultiplexer circuit having an input terminal and a plurality of output terminals corresponding in number to said plurality of input terminals of said multiplexer circuits; first conductor means for interconnecting said plurality of keys individually to said multiplexer circuits and in common to said first demultiplexer input terminal; and a time slot signal generator for generating time slot signals to control said plurality of multiplexer circuits and said demultiplexer circuit in synchronism.



4,333,376
APPARATUS FOR REINFORCING NOTES SELECTED BY MORE THAN ONE KEY

Douglas R. Moore, Vernon Hills, and Richard S. Swain, Des Plaines, both of Ill., assignors to Norlin Industries, Inc., White Plaines, N.Y.

Continuation of Ser. No. 824,906, Aug. 15, 1977, abandoned. This application May 16, 1980, Ser. No. 150,330
Int. Cl.³ G10H *1/02*
U.S. Cl. 84—1.27 **15 Claims**



1. In an electronic musical instrument, improved apparatus for generating a plurality of musical notes, each note being generated at either a first level of sound intensity or a second level of sound intensity, comprising:

playable keys, each key manually actuable for commanding generation of a number of musical notes;

coupler means manually actuable for controlling the number of notes to be generated by the actuation of a key;

tone signal generation means for generating a plurality of tone signals, each said tone signal corresponding to a musical note;

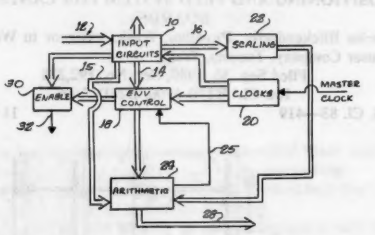
command means responsive to manual actuation of said keys for generating a number of commands for each key actuated, each said command corresponding to a different note, said command means enabling said tone signal generation means to provide a tone signal for each different note associated with generated commands, said command means being responsive to said coupler means for controlling the number of commands generated for each key; and

converting means for converting tone signals to audible notes, each note being generated at either a first level of sound intensity or a second level of sound intensity, said converting means for detecting substantially simultaneous generation of two commands corresponding to the same note for generating the same note at said second level of sound intensity, said converting means for detecting substantially simultaneous generation of three commands corresponding to the same note for generating the same note at said second level of sound intensity, said converting means for generating a note at said first level of sound intensity in response to a sole command from said command means.

4,333,377
TONE GENERATION SYSTEM FOR ELECTRONIC MUSICAL INSTRUMENT

Thomas A. Niezgoda, DeKalb, and Carl P. Oppenheimer, Sycamore, both of Ill., assignors to Acoustic Standards, Orange, Calif.

Continuation of Ser. No. 67,425, Aug. 17, 1979, abandoned. This application Mar. 3, 1981, Ser. No. 240,183
Int. Cl.³ G10H *1/057, 1/46*
U.S. Cl. 84—1.27 **9 Claims**



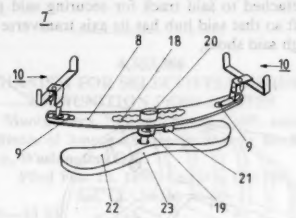
1. In an electronic musical instrument of the type wherein an audible tone is generated electronically in response to an actuation of tone initiating means of the instrument by a player, an envelope generation system for producing a plurality of envelope signals which define a preselected envelope waveform, said envelope generation system comprising: input circuit means responsive to player actuation of said tone-initiating means for producing envelope control signals and for producing a series of envelope count signals, clock means for generating a series of timing signals, envelope control circuit means responsive to said envelope control signals and to said timing signals for generating a series of predetermined digital increment defining signals, arithmetic circuit means for performing predetermined arithmetic functions utilizing said increment defining signals and said envelope count signals to produce therefrom a series of digital envelope signals collectively defining said envelope waveform wherein said arithmetic circuit includes means for producing said series of digital envelope signals Y_X in accordance with the equation $Y_X=Y_X-1\pm\Delta Y$ where x represents ones of said series of envelope count signals, Y_X and Y_X-1 represent ones of said digital envelope signals produced in response to envelope count signals x and $x-1$, and ΔY represents one of said digital increment defining signals, said envelope generation system further including scaling means for producing a digital scaling signal corresponding to the intensity of player actuation of said tone initiating means and wherein said arithmetic circuit means further includes means for producing said series of digital envelope signals Y_x in accordance with the equation $Y_X=Y_X-1\pm S\cdot\Delta Y_X$, where S represents said digital scaling signal.

4,333,378

DEVICE FOR SUPPORTING A MUSICAL INSTRUMENT

Alois Hrdlicka, Zürcherstrasse 135, CH-8406 Winterthur, Switzerland

Filed Dec. 4, 1980, Ser. No. 213,165
Int. Cl.³ G10G *5/00*
U.S. Cl. 84—280 17 Claims



1. A device for supporting a musical instrument on the body of a musician, the device comprising:

rest means for resting the instrument on the body of the musician;

a support member;

clamping means at each end of said support member for clamping respective edges of the musical instrument, said clamping means spacing said support member away from the musical instrument; and

locking means for selectively locking said support member in a particular orientation with respect to said rest means said locking means including only one selectively lockable universal joint disposed between and connected to said support member and said rest means.

4,333,379

STRINGING FOR MUSICAL INSTRUMENTS

Erhard Meinel, and Käthe Meinel, both of Wallensteinstr. 24, Geretsried D-8192, Fed. Rep. of Germany

Filed Apr. 21, 1981, Ser. No. 256,069
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1980, 3016723
Int. Cl.³ G10D *3/10*
U.S. Cl. 84—297 S 4 Claims

1. In stringing for plucked musical instruments provided with treble strings and with low note strings with steel core, and wire wrapping, wherein the treble strings and the steel cores of the low note strings consist of bronzed gray cast steel, which is tinned or nickeled or has a coating of a ferromagnetic, corrosion-resistant metal alloy, the improvement characterized in that the treble strings and the steel cores of the low note strings additionally have a surface coating of gold and the wrapping wire of the low note strings consists of nickeled iron or an iron/nickel alloy with a surface coating of gold.

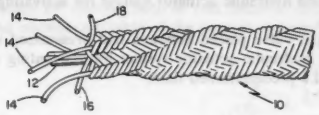
4,333,380

METHOD FOR MAKING BRAIDED PACKING

Peter F. Kozlowski, Billerica, Mass., assignor to A. W. Chesterton Company, Stoneham, Mass.

Division of Ser. No. 924,520, Jul. 14, 1978, Pat. No. 4,256,011, which is a continuation-in-part of Ser. No. 754,254, Dec. 27, 1976, Pat. No. 4,100,835. This application Jan. 30, 1981, Ser. No. 230,019
Int. Cl.³ D04C *1/06*
U.S. Cl. 87—6 6 Claims

1. The method of braiding a braid having a normal helical twist comprising providing a plurality of carriers having braid strands thereon, extending said braid strands to a point of convergence, moving said carriers with said braid strands in one direction about said point in a predetermined braiding pattern thereby forming a braid at said point of convergence comprising rows of braid strands, gripping said braid at said point of convergence and rotating said braid about its axis at the point of convergence as said carriers are moved in said one



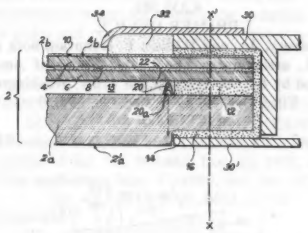
direction, whereby said rows of braid strands are braided into a braid with a normal helical twist.

4,333,381

PLATE-GLASS FITTED WITH AN EXPLOSION-CUTTING DEVICE

Paul H. Boeglin, Maule, and Claude R. Chigot, Saint-Nazaire, both of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Dec. 27, 1979, Ser. No. 107,605
Claims priority, application France, Jan. 4, 1979, 79 00192
Int. Cl.³ B64C *1/32*
U.S. Cl. 89—1 B 5 Claims



1. A plate-glass window fitted with an explosion-cutting device for obtaining an emergency exit by cutting said window along a well-determined outline, wherein said plate-glass window is constituted by two respectively inner and outer parallel walls between which is maintained an empty space and wherein said device comprises a detonating and cutting fuse, inserted along said outline between said walls and mounted with damping means, so that the detonation of said fuse produces an anisotropic detonating action, said fuse being orientated in order that said detonating action is applied on said outer wall so that operation of said fuse gives rise simultaneously along the cutting outline on the one hand to breakage and ejection of said outer wall and on the other hand to embrittlement of said inner wall upon detonation.

4,333,382

BOOST ASSISTED MISSILE LAUNCHER

Lloyd J. Holt, China Lake, and Clayton E. Panlaqui, Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 26, 1979, Ser. No. 107,236
Int. Cl.³ F41F *3/04*
U.S. Cl. 89—1.806 10 Claims

1. A boost assisted missile launcher for launching missiles from aircraft comprising:

support means mounted within the launcher for holding the missile until missile launch is desired;

guide means connected to said support means for launching said missile along a predetermined path;

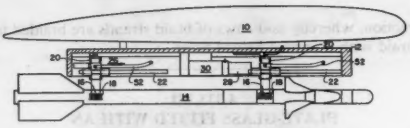
drive means for propelling said missile along said guide means;

a telescoping piston assembly mounted to said support means for driving said missile to a predetermined velocity;

a hydraulic actuator system with at least one input for expanding said telescoping piston;

a pressurized vessel for a fluid media with at least one input to said hydraulic actuator system for activating said system;

a poppet valve placed between said pressurized vessel and said hydraulic actuator system for preventing activation until a predetermined time;



a solenoid, electronically connected to said power supply and placed about said poppet valve so as to open said poppet valve when said solenoid is triggered by said power supply; and

a power supply connected to said drive means for triggering said drive means.

4,333,383

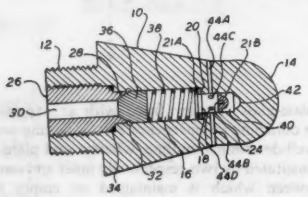
PRIMER DEVICE

LeRoy Stansbury, Jr., and William F. Donovan, both of Aberdeen, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 29, 1979, Ser. No. 89,020

Int. Cl.³ F41F *1/04*

U.S. Cl. 89—7 **14 Claims**



1. In a primer device having a primary propellant contained in a cavity of a breech body, a coupling means for igniting a main charge, comprising:

a housing having a central chamber, said chamber having an inlet and outlet port, said housing and its inlet port being sealingly mountable over said cavity, said outlet port being adjacent to said main charge;

a valve means mounted to said inlet port for sealing said cavity from said chamber, said valve means being operable to allow communication between said cavity and chamber in response to the pressure in said cavity exceeding that of said chamber by a given value pressure; and

a frangible seal mounted at said outlet port for sealing it, said seal being sized to rupture in response to a predetermined differential pressure across it.

4,333,384

ROTARY RACK LAUNCHER WITH DIRECT LOAD PATH SUSPENSION

Alison M. Arnold, Greenbank, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 13, 1980, Ser. No. 159,372

Int. Cl.³ F41F *3/06*

U.S. Cl. 89—1.803 **14 Claims**

1. A rotary rack launcher, comprising:

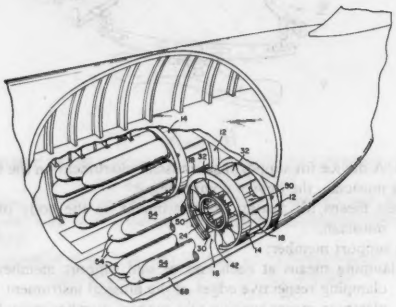
a rotatable hub,

spaced spokes extending radially outwardly from said hub, shoes extending from the outer ends of said spokes,

a track extending generally peripherally around said spokes and said shoes,

said shoes being adapted to ride on and be secured to said track so that said hub, said spokes, and said shoes can be moved relative to said track and be supported thereby,

means attached to said track for securing said track to an aircraft so that said hub has its axis transverse to a plane through said shoes,



said track being cutaway peripherally so that a launch may be made from a lower portion thereof below said axis, said cutaway portion of said track being along the periphery sufficiently to extend between two adjacent spokes, and

means adjacent said hub and the inner ends of said spokes for supporting launchable material between each pair of consecutive spokes,

whereby the loadpath for material launchable through said cutaway supported between a pair of adjacent spokes is directly through said means adjacent said hub, through the hub, to the spokes, to the track, and to the aircraft.

4,333,385

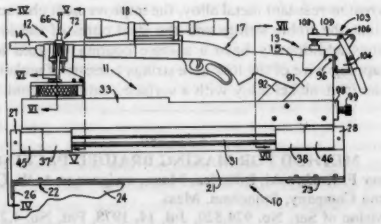
GUN SIGHTING APPARATUS

W. Jay Culver, 250 17 Mile Rd., Kent City, Mich. 49330

Filed Aug. 7, 1980, Ser. No. 176,223

Int. Cl.³ F41F *25/00*

U.S. Cl. 89—37 BA **6 Claims**



1. An apparatus for adjusting the sights of a gun having an elongated barrel and a butt, comprising:

elongated base means;

elongated rod means rigidly secured to and extending lengthwise of said base means and having a pair of spaced abutment means;

elongated gun support means having slide means secured thereto and mounted upon said rod means for movement lengthwise thereof, said slide means being disposed between and spaced from said abutment means;

resiliently flexible, substantially solid state means disposed

snugly between each abutment means and the adjacent slide means;

a pair of spaced cradle means mounted upon said gun support means and arranged for supporting said gun barrel and said gun butt; and

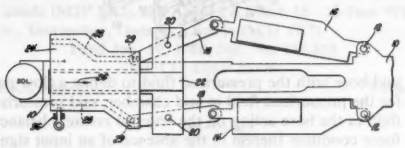
manually operable clamp means for engaging said barrel and said butt for firmly holding them rigidly within said cradle means.

4,333,386

MECHANISM FOR SELECTIVELY ADJUSTING AMMUNITION FEED CHUTES

Donald N. Montgomery, Newport Beach, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 15, 1980, Ser. No. 121,765
Int. Cl.³ F41D *10/00*
U.S. Cl. 89—33 SF **6 Claims**



1. In a gun having a receiver, first and second ammunition feed chutes, each movably mounted between a standby position spaced from the receiver and a feeder position engaged with the receiver, and a chute actuator plate (**24**) movable in the direction of the gun axis from a first rearward position in which only one chute is set to feed ammunition to a second intermediate position in which neither chute can feed ammunition, to a third forward position in which only the other chute is set to feed ammunition; the improvement comprising electrically-energized powered mechanism for moving the chute actuator plate to its three positions, said mechanism including a slideway (**30**) oriented parallel to the direction of motion of the chute actuator plate, a toothed rack (**34**) slidably mounted in the slideway and having a disengageable connection (**38**) with the chute actuator plate, a rotary pinion gear (**52**) stationed at a point along the slideway to move the rack, a reversible electric motor (**54**) drivingly connected to the pinion gear, first and second motor limit switches (**60, 62**) located at the slideway, each switch having a depressable actuator; said rack having first and second control tracks (**68, 70**) on its side surface individually engaged by respective ones of the switch actuators, the tracks being contoured to provide three different switch condition combinations for selectively de-energizing the motor when the chute actuator plate reaches its three aforementioned positions.

4,333,387

ANTI-JAM HYDRAULIC SERVO VALVE

Clyde R. Seitz, Laguna Beach, Calif., assignor to Bertea Corporation, Irvine, Calif.

Continuation of Ser. No. 888,700, Mar. 21, 1978, abandoned.
This application Mar. 6, 1980, Ser. No. 127,735
Int. Cl.³ F01B *25/26*
U.S. Cl. 91—1 **22 Claims**

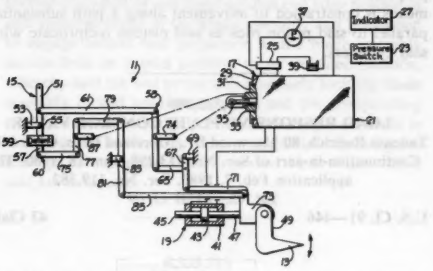
1. A control system for controlling the flow of fluid under pressure to a controllable device, said control system comprising:

a housing having a supply port for receiving fluid under pressure and a return port for returning the fluid from the housing, said housing having first and second ports for supplying the fluid to the device and for receiving fluid from the device;

first valve means mounted for movement in said housing and including a first slide movable for controlling the flow of fluid from the supply port to said first and second ports and from said first and second ports to said return port;

a second slide mounted for movement in said housing;

input means for moving both of said slides in said housing during normal operation of the control system;



said input means including detent means responsive to the jamming of either of said slides for permitting the input means to drive the other of said slides; and

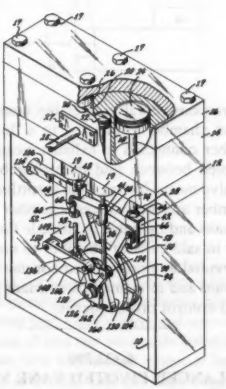
jam responsive means for sensing the jamming of either of said slides and providing a signal in response thereto.

4,333,388

RECIPROCATING ENGINE WITH IMPROVED PISTON MOVEMENT STABILIZING MEANS

John H. Hedger, P.O. Box 357, Lakeside, Calif. 92040

Continuation of Ser. No. 969,660, Dec. 15, 1978, abandoned.
This application May 27, 1980, Ser. No. 153,774
Int. Cl.³ F01B *1/00*; F01L *31/00*
U.S. Cl. 91—186 **2 Claims**



1. In a fluid driven reciprocating engine which comprises an engine block containing at least two parallel cylinders, a piston located in each of said cylinders for parallel reciprocating movement therein, piston rods rigidly connected at a first end to each of said pistons extending out of said cylinders along the cylinder centerlines into a housing containing connecting means operatively connecting a second end of each of said piston rods to a single crank pin on a rotary output shaft, and valve means within said block for selectively supplying fluid to and exhausting fluid from said cylinders above and below said pistons, the improvement wherein said connecting means comprises a single solid member having spaced means flexibly attaching said single solid member to said second ends of said piston rods, said second ends of said piston rods have a roughly

"C" shaped configuration partially surrounding said single solid member and said spaced means comprise flat link members, and further including a swing link stabilizing means pivotably connected at one end to a support rigidly secured to said housing and pivotably connected at a second end to said single solid member, said swinging link extending approximately perpendicular to said piston rods, whereby said connecting means is constrained to movement along a path substantially parallel to said piston rods as said pistons reciprocate within said cylinders.

4,333,389

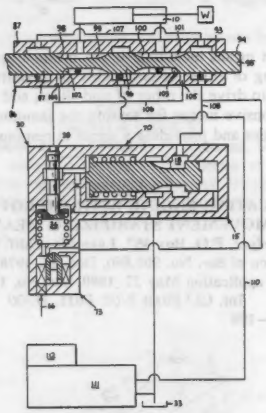
LOAD RESPONSIVE FLUID CONTROL VALVE

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Continuation-in-part of Ser. No. 113,288, Jan. 18, 1980. This application Feb. 7, 1980, Ser. No. 119,382

Int. Cl.³ F15B *13/04*

U.S. Cl. 91—446 **43 Claims**



30. A load responsive valve assembly comprising a housing having an inlet chamber connected to a fluid motor, and an exhaust chamber connected to exhaust means, control orifice means interposed between said inlet chamber and said fluid motor, first valve means having fluid throttling means between said inlet chamber and said exhaust chamber controllable by a pilot valve means and operable to throttle fluid flow from said inlet chamber to said exhaust chamber to maintain a constant pressure differential at a preselected constant level across said pilot valve means and to maintain a constant pressure differential across said control orifice means.

4,333,390

BALANCED PIVOTED VANE VALVE

Billy S. Hegg, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 29, 1980, Ser. No. 126,159

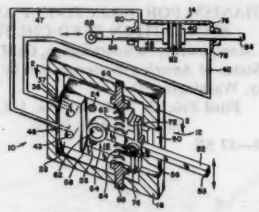
Int. Cl.³ F15B *13/04*

U.S. Cl. 91—467 **8 Claims**

1. In a control member having a housing with a chamber therein, said housing having an entrance port connected to a source of pressurized fluid, first and second diametrically opposite arcuate operational ports concentric to said entrance port and connected to a fluid pressure responsive device, and an exit port for providing continual communication between the chamber and the environment surrounding the housing, and a valve located in the chamber for directing pressurized fluid from the entrance port to one of said first and second arcuate operational ports while allowing the other to be communicated to the chamber in response to an input signal, characterized in that said valve includes:

a lever arm having a first end and a second end, said first end having a cylindrical valve integral therewith, said cylindrical valve having a cylindrical bore therethrough that extends from a first face to a second face, said first and second faces engaging the housing; and

a pivot pin extending through the lever arm to locate said cylindrical valve adjacent the entrance port and connect



said bore with the pressurized fluid to define a flow path for the pressurized fluid in said chamber, said pressurized fluid in the bore acting on the lever to create a balanced force condition therein in the absence of an input signal, said cylindrical valve being moved in an arc by an input signal applied to said second end to connect said bore with one of said first and second arcuate operational ports and supply pressurized fluid to the pressure responsive device corresponding to the input signal.

4,333,391

ADJUSTABLE SPRING-RETURN ACTUATOR

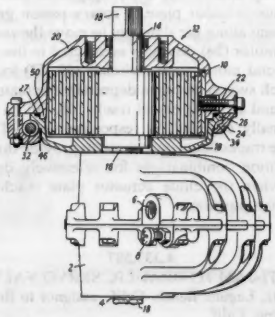
Alan R. B. Nash, 39 Abbott's Ride, Farnham, Surrey, England

Filed Feb. 29, 1980, Ser. No. 126,128

Claims priority, application United Kingdom, Mar. 2, 1979, 7907453

Int. Cl.³ F01C *9/00;* **F01B** *31/00*

U.S. Cl. 92—121 **11 Claims**



1. A pressure-fluid operated actuator comprising a casing, a displacement member in said casing, pivot bearing means between said member and the casing providing a pivot axis for the displacement member, and porting in the casing for a pressure fluid whereby the member is rotatable about said axis under the action of the pressure fluid, a biasing spring connected to the displacement member to return it to an end position from which it can be displaced by said pressure fluid, a housing for said spring comprising two parts that are respectively fixedly secured to the casing and rotationally displaceable relative to the casing about said axis of rotation, the spring having one end fixed to the displacement member and another end fixed to said displaceable housing part for variation of the

torque exerted by the spring on the displacement member by rotation of said displaceable part to an adjusted angular position, a worm and wormwheel mechanism for said rotation including a wormwheel element comprising teeth on one of the housing parts and a worm element carried by the other of the housing parts, an arcuate region of the worm element being engaged by the wormwheel teeth, said region being non-symmetrically offset with respect to a plane containing the worm axis and normal to the axis of rotation of said displaceable housing part, the wormwheel teeth for engaging said region of the worm element being formed integrally on its housing part, whereby the worm and wormwheel elements may be brought into mesh by relative movement of the housing parts towards each other in the direction of said axis of rotation, so that said housing parts may, if desired, be of relatively simple die-cast or moulded construction.

4,333,392

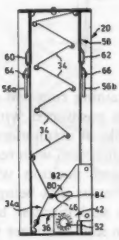
FIRE DAMPER

Michael T. Nailor, 189 Old Yonge St., Willowdale, Ontario, Canada (M2P 1R2), and Andrew J. Hart, 15 - 33 Four Winds Dr., Downsview, Ontario, Canada (M3J 1K7)

Filed Jan. 14, 1980, Ser. No. 111,619

Int. Cl.³ E05F *15/20*

U.S. Cl. 98—1 **7 Claims**



1. A fire damper comprising:

a frame defining a generally rectangular central opening and having first and second ends and two opposite sides;

a blade assembly coupled to said first end of the frame and including a plurality of generally rectangular blades pivotally connected together end to end for movement relative to one another between a position in which the blades are disposed in a folded configuration at said first end of the frame, whereby said frame opening is unobstructed, and a position in which the blades are unfolded and extend across and close said opening;

spring means biassing said blades toward said unfolded position;

fusible link means normally retaining said blades in said folded position and adapted, when exposed to a predetermined high temperature, to release the blades and allow them to move to said unfolded position under the influence of said spring means; and,

means adapted to retain said blade assembly in said unfolded position after the blades have been released by said fusible link means;

each said blade comprising a planar central portion having side edges for co-operation with said sides of said frame and opposite end edge portions each of arcuate shape in cross-section and extending longitudinally of the relevant edge of the blade so as to define a formation of part cylindrical shape engaged with a similar edge portion of an adjacent blade for defining said pivotal connection between the blades, and said blade assembly including an endmost blade which is disposed adjacent said second end of the frame in the unfolded position of the blades with an outer one of its said arcuate end edge portions in co-operation with said second end of the frame and an inner one of its said edge portions spaced inwardly of the frame and pivotally connected to an adjacent blade in said assembly by engagement of said arcuate end edge portion around a corresponding arcuate end edge portion of said adjacent blade;

said retaining means comprising at least one locking member secured to said frame adjacent said second end thereof and defining a locking projection, and an integral tab portion formed from part of said inner arcuate end edge portion of said endmost blade of the blade assembly and positioned to engage behind said projection as the blade assembly moves from its folded position to its unfolded position, whereby said tab and projection positively lock the blade assembly in said unfolded position and the co-operating part cylindrical end edge portion of said adjacent blade in said assembly serves to prevent passage of flame and gases through said portion of the endmost blade from which said tab is formed.

4,333,393

PITCHING MECHANISM FOR LAUTER TUN KNIVES

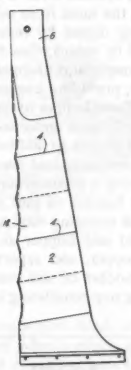
John C. Hancock, Willington; John M. Winwood, Mickelover, and Noel R. Wilkinson, Burton on Trent, all of England, assignors to Robert Morton D.G. Limited, Burton-on-Trent, England

Filed Mar. 4, 1980, Ser. No. 127,139

Claims priority, application United Kingdom, Jul. 17, 1979, 7924815

Int. Cl.³ C12G *3/02*; B01F *15/02*

U.S. Cl. 99—277.2 **3 Claims**



1. In an apparatus for working the contents of a lauter tun, said apparatus comprising at least one lauter tun knife, drive means for supporting said knife within and moving said knife through the contents of said tun, said knife comprising a longitudinal support axis, first and second edges, at least one blade pitched relative to said axis, and said first edge leading said second edge through said contents, the improvements comprising:

means for changing direction of moving of said knife between forward and reverse such that said second edge leads said first edge through said contents;

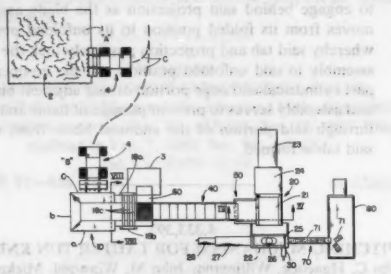
means for pivotally mounting said knife to said drive means for angular displacement of said knife about said axis by pressure exerted on said blade by said contents during said moving; and

means for limiting the extent of said angular displacement between a first position and a second position such that said knife is pivotal between said first and second positions automatically according to which of said first and second edges is leading during said moving.

4,333,394
METHOD FOR HANDLING AND BALING METALLIC SCRAP MATERIAL

Stanford M. Brown, 1647 Thornapple River Dr., SE., Grand Rapids, Mich. 49506

Filed Dec. 31, 1979, Ser. No. 108,508
Int. Cl.[3] B30B 7/02, 15/30
U.S. Cl. 100—42 4 Claims



1. A process for handling and baling metallic scrap material comprising the steps of providing a storage area for storing said material; providing a baling means at a location remote from said storage area; providing a combination hopper and conveying means remote from said storage area and said baling means, said hopper and conveying means including a hopper with an open bottom located over a conveyor; picking up material and carrying the same from said storage area to said hopper and conveying means by means of a front loader; dumping said material by means of said front loader into said hopper whereby said material is dropped into said hopper and falls on said conveyor; providing a second conveyor; conveying said material out of said hopper to said second conveyor by means of the conveyor located under said hopper; transferring said material from said hopper to said baling means and during such transferring step weighing said materials and dividing the same into batches having a predetermined weight; depositing each of said weighed batches of said material in said baling means and during such dumping step stopping the conveying of said material out of said hopper and the transfer of said material from said hopper; and separately compacting and baling said weighed batches of said material and during such compacting and baling step reinitiating the said conveying and transferring step.

4,333,395
CONTAINER CRUSHING DEVICE

Garrett W. Kurtz, 946 Main Ave., Durango, Colo. 81301

Filed Feb. 11, 1980, Ser. No. 120,141
Int. Cl.[3] B30B 7/00, 9/32
U.S. Cl. 100—233 7 Claims

1. A device for crushing a metal container to reduce the bulk of the container and facilitate recycling for the metal content of the container, the container having a pair of opposed ends, said device comprising:

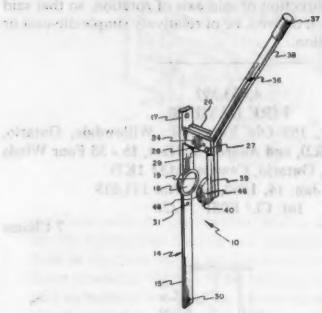
a generally circular base plate;

an annular retaining ring integral with said circular base plate and having a substantially identical peripheral configuration as said circular base plate, said annular retaining ring being sized to receive one of said pair of opposed ends therethrough;

base means for securing said circular base plate and said annular retaining ring against relative movement;

a generally circular disk of substantially uniform thickness having an annular groove formed in one face thereof, said annular groove capable of receiving the other of said pair of opposed ends and defining a raised central portion and a raised outer, annular portion, the circular edge of said central portion being chamfered along substantially the entire circumference thereof to aid in positioning said other said pair of opposed ends within said annular groove; and

an operating lever pivotally secured to said securing base means and having said generally circular disk fixedly secured to one end thereof, said operating lever being angled intermediate the length thereof and being pivotally secured to said securing base means at the position where said lever is angled, said lever being operable to secure said container against movement in a first position when said one of said pair of opposed ends is received through

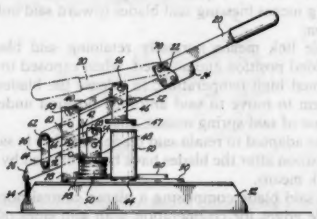


said annular retaining ring and said other of said pair of opposed ends is positioned within said annular groove, said lever capable of manipulating said circular disk in a relatively axial direction with respect to said circular base plate to a second position wherein said container is crushed, said circular disk being offset from and angeled with respect to said circular base plate in said second position to crush said container into relatively small bulk, and said lever capable of manipulating said circular disk away from said circular base plate to permit movement of said crushed container with respect to said circular disk and said circular base plate due to gravitational force.

4,333,396
TWO-STAGE CAN CRUSHER

Russell D. Longnecker, P.O. Box 731, Mt. Vernon, Wash. 98273

Filed Apr. 4, 1980, Ser. No. 137,515
Int. Cl.[3] B30B 9/32
U.S. Cl. 100—233 14 Claims



1. A device for crushing a can along its longitudianl axis comprising:

means forming a horizontal base;

an upright stanchion mounted upon said base;

a long lever arm crossing said stanchion and being pivotally connected thereto;

a short lever arm crossing said stanchion and pivotally connected to said stanchion between said long lever arm and said base means;

a first crush head pivotally connected to said long lever arm and cooperating with said base upon rotation of said long lever arm toward said base to axially crush a cylindrical container placed between said crush head and said base;

a second crush head pivotally connected to said short lever arm and cooperating with said base upon rotation of said short lever arm toward said base to axially crush a cylindrical container placed between said crush head and said base;

a first link pivotally connected endwise between said first crush head and said stanchion;

a second link endwise pivotally connected between said second crush head and said stanchion; and

linkage means interconnecting said long lever arm and short lever arm whereby rotation of said long lever arm about its pivotal mounting on said stanchion induces corresponding rotational movement of said short lever arm.

4,333,397

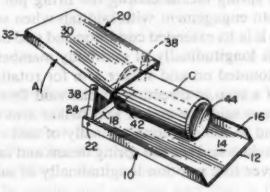
CAN FLATTENING DEVICE

Edward E. Modes, 1417 Shawnee Trail, Deerfield, Ill. 60015

Filed Dec. 19, 1980, Ser. No. 218,298

Int. Cl.³ B30B *1/04, 7/00*

U.S. Cl. 100—233 **18 Claims**



1. A device for individually flattening cylindrical cans, comprising:

a base for supporting a can in a crushing position in which the can is disposed on its side on said base; and

lever means pivotally attached to said base, said lever means being swingable upwardly from said base to a raised position to permit a can to be positioned on its side on said base and downwardly toward said base for crushing the positioned can, said lever means being jointed and including a can engaging edge projecting from the joint whereby the edge is pivotable both about the pivot axis of said lever means on the base and about said joint to effect crushing of one side of the can at a crease adjacent one end thereof with said one end flattened over said one side, the partially flattened can then being turned over for similarly flattening the other side and other end thereof.

4,333,398

DRIVING FORCE CONTROL SYSTEM FOR IMPACT PRINTER

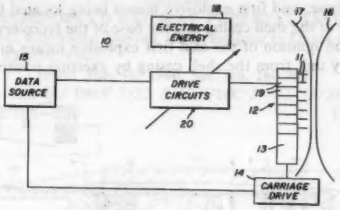
Andrew B. Carson, Jr., and Samuel C. Harris, Jr., both of Waynesboro, Va., assignors to General Electric Company, Waynesboro, Va.

Filed Nov. 6, 1980, Ser. No. 204,632

Int. Cl.³ B41J *7/84, 7/92, 9/38, 9/42*

U.S. Cl. 101—93.02 **13 Claims**

1. In an impact printer which develops a force whose direction is a function of the direction of drive pulses wherein said printer comprises a movable electromagnetic printing element located adjacent a backstop, a source of drive pulses for application to said printing element for moving the printing element from the backstop toward a record medium to print indicia and a source of damping pulses for application to the printing element after its return to the backstop from the record medium to minimize bounce of the printing element from the backstop, control means coupled to the source of drive pulses and to the source of damping pulses and responsive to the beginning of a drive pulse prior to the completion of the preceding damping pulse for varying the energy content of said drive pulse in proportion to the amount of overlap of said drive pulse with the preceding damping pulse.



4,333,399

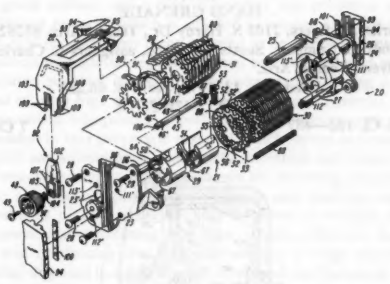
METHOD OF MAKING PRINT HEAD

Paul H. Hamisch, Jr., Franklin, and Robert M. Pabodie, Dayton, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 95,848, Nov. 19, 1979, Pat. No. 4,275,654. This application Mar. 13, 1981, Ser. No. 243,237

Int. Cl.³ B41N *11/00*

U.S. Cl. 101—401.2 **5 Claims**



1. Method of making a print head, comprising the steps of: providing a first set of wheels which are coupled to printing elements, a second set of read wheels having human readable indicia, and a pair of side plates, with the first set of wheels having gears which can mesh with gears on the second set of wheels, passing pins through one side plate, loading the first set of wheels and the second set of wheels onto respective supports with the pins extending through alignment openings in the wheels so that all the wheels are in geared relationship and the read wheels indicate which printing elements are at a printing position, and inserting a selector shaft into holes of either set of wheels.

4,333,400

TWO STAGE PARACHUTE FUZE RECOVERY SYSTEM

John F. McNelia, and Carl R. Peterson, both of Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

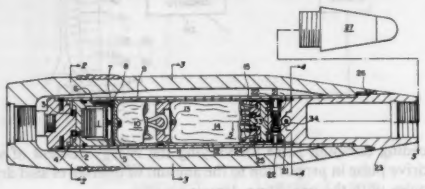
Filed Feb. 1, 1980, Ser. No. 117,702

Int. Cl.³ F42B *4/08*

U.S. Cl. 102—348 **11 Claims**

1. A gun shell type projectile including an external frontally mounted fuze member, said gun shell type projectile comprising in combination a generally cylindrical outer shell casing, containing within the body of the projectile a longitudinal

cavity, a two stage parachute-fuze recovery unit mounted within the said longitudinal cavity comprising in combination a first stage parachute, a first explosive means, a timing device and primer with associated means to activate said primer at a pre set time; said first explosive means being located between the base of the shell casing and the base of the recovery unit so that upon ignition of the said first explosive means ejects the recovery unit from the shell casing by exerting positive pressure on the opening between the shell casing and on the base of the recovery unit the said parachute recovery system, explosive means to eject the said two stage recovery unit from the shell casing; means to deploy the first parachute at the time the recovery unit is ejected from the unit and a second explosive means that releases the second stage parachute, wherein the second stage parachute is released by said second explosive means that is actuated by the centrifugal force exerted by the spin imparted to the shell casing by the gun barrel.

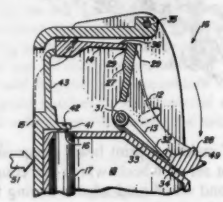


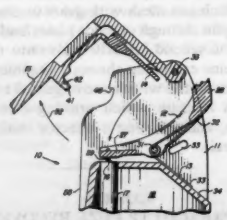
4,333,401

HAND GRENADE

Charles M. Byers, 2105 S. Hardy Dr., Tempe, Ariz. 85282, and Jody L. Numbers, Scottsdale, Ariz., assignors to Charles M. Byers, Tempe, Ariz.

Filed Aug. 13, 1979, Ser. No. 66,289
Int. Cl.³ F42B *27/08*
U.S. Cl. 102—487 **7 Claims**





1. A hand grenade having a striker mechanism that is uncocked until immediately prior to the use of the grenade, the hand grenade comprising:

an elongated hollow close-ended body member,

a striker arm pivotally mounted on the outside periphery of one end of said body member,

a firing pin mounted on and adjacent one end of said striker arm,

a primer mounted on said one end of said body member,

a first spring means for biasing said striker arm in one direction to cause said firing pin to move toward said primer,

a time delay train mounted in said body member in burning association with said primer,

at least one ignitable charge mounted in said body member for actuation by said train,

a safety lever pivotally mounted on said body member,

said safety lever comprising an L-shaped configuration, one leg of which extends across said one end and is pivotally mounted to said body member and its other leg arranged in one position to extend longitudinally of said body member and movable to a position laterally of said body member,

a sear arranged to extend juxtapositioned to said one leg of said lever for limited movement therealong,

a second spring means comprising a flat cantilevered strip connected at one end to said other leg of said lever and at its other end to said sear for normally biasing said sear away from said other leg of said lever and along said one leg of said lever,

a tab comprising a part of said other leg of said lever for extending over said primer and in the path of movement of said firing pin when said other leg of said lever is positioned longitudinally of said body member,

said first spring means biasing the firing pin of said striker arm into engagement with said tab when said first spring means is in its extended condition and said other leg of said lever is longitudinally of said body members, and

means mounted on said striker arm for rotating said striker arm in a second direction to bias said first spring means and cause said one end of said striker arm to engage said sear and to move it longitudinally of said one leg of said lever to bias said second spring means and said other leg of said lever to a position longitudinally of said body member,

said other leg of said lever being hand-held against said body and when released, moving laterally of said body member under the bias of said second spring means thereby moving said sear out of engagement with said striker arm and said tab out of blocking engagement with said primer,

said first spring means then biasing said firing pin into engagement with said primer.

4,333,402

ARRANGEMENT FOR LAUNCHING INTERFERENCE MATERIAL

Sven Landstrom, Fjallgatan 16, S116 45 Stockholm, and Kaj Lundahl, David Bagares gatan 26A, S-111-38 Stockholm, both of Sweden

PCT No. PCT/SE79/00039, § 371 Date Oct. 23, 1979, § 102(e) Date Oct. 23, 1979, PCT Pub. No. WO79/00658, PCT Pub. Date Sep. 6, 1979
PCT Filed Feb. 22, 1979, Ser. No. 189,832
Int. Cl.³ F42B *13/42*
U.S. Cl. 102—505 **5 Claims**

1. A projectile that carries a store of radiation interference medium for dispersive discharge at a predetermined time following expulsion of the projectile from a substantially tubular launcher under the force of pressure gas acting upon a rear end of the projectile, said projectile being characterized by:

A. an elongated casing having front and rear end walls,

(1) said rear end wall having a port therein through which pressure gas can enter the interior of the casing during expulsion of the projectile from a launcher, and

(2) one of said end walls being separable from the remainder of the casing in an endwise outward direction;

B. a piston slidable in said direction in the interior of the casing and cooperating with said one end wall to define a compartment in the casing wherein said medium is stored;

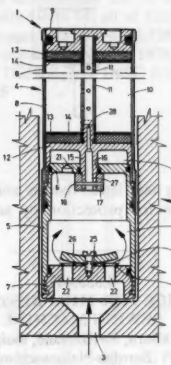
C. rigid means providing a connection between said piston and said one end wall whereby the latter is constrained to move in said direction in unison with the piston;

D. a partition fixed in the interior of said casing, between said piston and the other of said end walls, said partition

(1) cooperating with said other end wall to define a first chamber of substantially fixed volume and

(2) cooperating with said piston to define an expandable second chamber, and

(3) having a restricted passage therethrough that provides for retarded flow of pressure gas from said first chamber to said second chamber;



E. means comprising a check valve providing for substantially unrestricted flow of pressure gas from said port to said first chamber but preventing flow of pressure gas from said first chamber through said port; and

F. means providing a disruptable connection between a part fixed in the casing and another part that is fixed to the piston, said disruptable connection confining the piston against motion relative to the casing in said direction until the piston is released by force upon it in excess of a predetermined value, exerted by pressure gas in said second chamber.

4,333,403

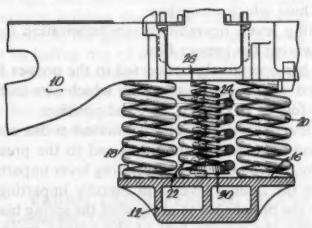
RETAINER RAILWAY CAR TRUCK BOLSTER SPRING

Carl E. Tack, Elmhurst, Ill., and Sergei G. Guins, Okemos, Mich., assignors to TransDyne, Inc., Chicago, Ill.

Filed Apr. 9, 1979, Ser. No. 28,265

Int. Cl.³ B61F *5/06;* **F16F** *1/06, 1/12, 3/04*

U.S. Cl. 105—197 R **8 Claims**



1. In a railway truck comprising a pair of side frames having windows therein for receiving the ends of a bolster, and a plurality of spring groups extending upward from the floor of said window and supporting said bolster, said spring groups including a two stage spring group comprising an outer coil and an inner coil in coaxial relation with the outer coil, and retainer means for retaining said inner and outer coils in coaxial relation, said retainer means and said outer coil having a mating helical relation supporting the retainer means above the side frame window floor.

4,333,404

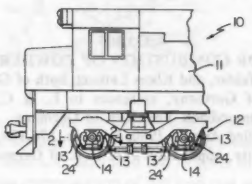
REINFORCED RAILWAY PEDESTAL LINER

Donald L. Kleykamp, Dayton, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Filed Jun. 16, 1980, Ser. No. 160,059

Int. Cl.³ B61F *5/32, 5/50;* **F16C** *27/02, 33/28*

U.S. Cl. 105—225 **11 Claims**



1. In a pedestal liner for a railway vehicle wherein said vehicle comprises, pedestal trucks comprising pairs of pedestal legs and a journal box disposed between each pair of pedestal legs, each journal box having a vertically disposed planar guide surface and a pair of spaced vertically disposed parallel side surfaces disposed on opposite sides of said guide surface, said pedestal liner being roughly U-shaped and having a bight provided with antifriction material which is adapted to engage said guide surface and a pair of parallel legs provided with antifriction material which is adapted to engage said side surfaces, said pedestal liner being adapted to be disposed between an associated pedestal leg and journal box and fastened to its associated pedestal leg, said antifriction material being comprised of ultra high molecular weight polymeric material, the improvement comprising a perforated reinforcing structure embedded in said polymeric material which serves as a matrix therefor and substantially completely surrounds said structure, said structure having openings therein for receiving said polymeric material completely therethrough and enabling better embedment of said structure, said structure providing reinforcement and preventing cold flow of said polymeric material, said reinforcing structure consisting of a single piece of material disposed in a substantially U-shaped configuration and being embedded between opposed outside surfaces of said bight and opposed outside surfaces of each of said parallel legs, and further comprising means for fastening said pedestal liner to its pedestal leg, said fastening means comprising at least one pair of aligned cylindrical bores in said legs each for receiving a fastener therethrough, each of said bores extending through said reinforcing structure.

2. In a pedestal liner for a railway vehicle wherein said vehicle comprises, pedestal trucks comprising pairs of pedestal legs and a journal box disposed between each pair of pedestal legs, each journal box having a vertically disposed planar guide surface and a pair of spaced vertically disposed parallel side surfaces disposed on opposite sides of said guide surface, said pedestal liner being roughly U-shaped and having a bight provided with antifriction material which is adapted to engage said guide surface and a pair of parallel legs provided with antifriction material which is adapted to engage said side surfaces, said pedestal liner being adapted to be disposed between an associated pedestal leg and journal box and fastened to its associated pedestal leg, said antifriction material being comprised of ultra high molecular weight polymeric material, the improvement comprising a perforated reinforcing structure embedded in said polymeric material which serves as a matrix therefor and substantially completely surrounds said structure, said structure having openings therein for receiving said polymeric material completely therethrough and enabling better embedment of said structure, said structure providing rein-

forcement and preventing cold flow of said polymeric material, said reinforcing structure consisting of a single piece of material disposed in a substantially U-shaped configuration and being embedded substantially centrally between opposed outside surfaces of said bight and opposed outside surfaces of each of said parallel legs, said bight having a particular thickness and each of said legs having an upper portion and a rear portion substantially equal in thickness of said particular thickness, and said substantially equal thickness upper portion providing a high strength junction at the upper portion of each leg to said bight and said substantially equal thickness rear portion providing a high strength portion for fastening said pedestal liner to its pedestal leg.

4,333,405

BURNER FOR COMBUSTION OF POWDERED FUELS

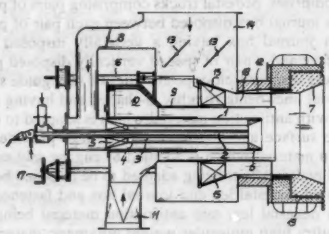
Sigfrid Michelfelder, and Klaus Leikert, both of Gummersbach, Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Aug. 7, 1980, Ser. No. 176,188

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1979, 2933060

Int. Cl.³ F23D *1/02*

U.S. Cl. 110—264 **10 Claims**



1. A burner, for combustion of powdered fuels, comprising: a main burner, including:

a core-air tube;

a dust tube surrounding at least a portion of said core-air tube;

a first mantle-air tube which surrounds at least a portion of said dust tube and is provided with an air inlet and a burner opening or discharge which widens conically toward a combustion chamber; and

a first twist blade ring, which is arranged at said air inlet of said first mantle-air tube and is axially displaceable; and

a dust-ignition burner, as an ignition device, concentrically arranged in said core-air tube and including:

an igniter;

an ignition-dust tube arranged concentrically around at least a portion of said igniter;

a second mantle-air tube, which surrounds at least a portion of said ignition-dust tube, for the ignition-dust flame, and second mantle-air tube being provided with an air inlet and discharge which widens conically outwardly; and

a second twist blade ring, which is arranged at said air inlet of said second mantle-air tube and is axially displaceable.

4,333,406

ANCHORING MEANS FOR REFRACTIVE BLOCKS

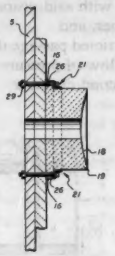
Max E. Duke, 3311 S. Shore Dr., Humble, Tex. 77338

Continuation of Ser. No. 85,244, Oct. 16, 1979, abandoned. This application Jun. 8, 1981, Ser. No. 271,630

Int. Cl.³ F23M *5/02*

U.S. Cl. 110—340 **4 Claims**

1. The combination of a refractory burner block of frangible material having an inner, heat exposed face and side walls with rib-like lateral extensions for accommodating other insulating material in protective contact with said side walls, of burner block anchoring means comprising angle bar framing with flanges facing and abutting said side walls and other flanges resting against inward faces of said rib-like extensions, and



means for securing said latter flanges and said framing to a support in position for protection by said other insulating material.

4,333,407

LIFTING DEVICE FOR THE PRESSER FOOT OF A SEWING MACHINE

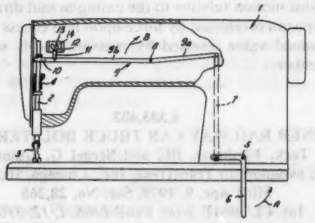
Werner Lerch, Steckborn, Switzerland, assignor to Fritz Gegauf Aktiengesellschaft Bernina-Nahmaschinenfabrik, Steckborn, Switzerland

Filed Nov. 6, 1979, Ser. No. 92,061

Claims priority, application Switzerland, Nov. 9, 1978, 11520/78

Int. Cl.³ D05B *29/00*

U.S. Cl. 112—237 **8 Claims**



1. A device for raising and lowering a presser foot of a sewing machine which comprises:

an operating lever, operable in synchronization for lifting and lowering the presser foot;

a presser bar operatively connected to the presser foot and provided with spring bias means which acts to hold the presser foot in a normally lowered position;

a double lever arm operatively connected at one end to the operating lever and at the other end to the presser bar, whereby, movement of the operating lever imparts movement to the double lever arm thereby imparting movement to the presser bar to act against the spring bias means for raising the presser foot of the sewing machine and further movement of the operation lever imparts movement to the double lever arm thereby permitting the spring bias means to impart movement to the presser bar to lower the presser foot; and

wherein a plate member containing a defined path is disposed adjacent to the double lever arm and a guide arm is operatively connected to the double lever arm, said guide arm being provided with a detent member which is adapted to traverse said defined path to selectively retain

said double lever arm, said operating lever and said presser foot in a raised position and to normally enable said double lever arm, said operating lever and said presser foot to assume said lowered position.

4,333,408

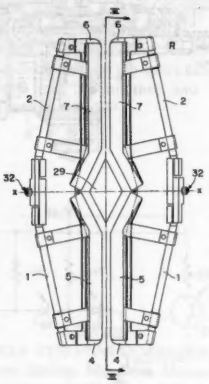
MACHINE FOR MANUFACTURING PANTYHOSE WITH GUSSET

Maria Maselli; Alberto Frullini, both of Via di Brozzi 151 A; Meri Elbetti, Via G. Oberdan 24, S. Donnina, and Luisa Frullini, Via B. della Gatta 14, all of Florence, Italy

Continuation-in-part of Ser. No. 46,928, Jun. 8, 1979, abandoned. This application Nov. 6, 1979, Ser. No. 91,741

Int. Cl.³ D05B *21/00;* **D05C** *9/04, 9/10*

U.S. Cl. 112—121.15 **7 Claims**



1. A machine for manufacturing pantyhose with a gusset, from two tubular stockings, comprising:

stocking support means operable to support two tubular stockings which are to be sewn together to form the pantyhose, said stocking support means including retractor devices, one for each tubular stocking, each of said retractor devices being independent of each other and substantially identical with each other;

stocking cutting means for slitting each stocking along a distance where the stockings are to be sewn together to form the pantyhose;

a sewing unit to sewing unit to sew the gusset to the one stocking;

means to dispose a gusset over the cut portion of one of the stockings, said last mentioned means including means for separately holding the gusset during sewing half of the perimeter of the gusset by said single sewing unit,

means including one of said retractor devices to move the other of the stockings into overlapping relationship with the gusset sewn to the one stocking; and

means for moving said sewing unit to sew the one stocking to the other stocking and to the gusset.

4,333,409

FABRIC LABEL FEEDING MEANS

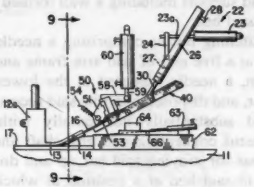
John L. Rockerath, Utica, N.Y., assignor to Cluett, Peabody & Co., Inc., New York, N.Y.

Filed Dec. 21, 1979, Ser. No. 106,013

Int. Cl.³ D05B *35/06*

U.S. Cl. 112—121.27 **6 Claims**

1. A fabric part label feed apparatus comprising a tape strip consisting of discrete individual labels joined end to end, storage means for said tape strip, means for removing said tape strip from said storage means, a sewing station, means for supporting and guiding said strip toward said sewing station, a feed rod continuously reciprocable through a work stroke of predetermined length toward and away from said supporting and guiding means and operable to engage said strip during each movement of said feed rod toward said supporting and guiding means during the continuous reciprocation of the feed rod to continously advance said strip incrementally toward said sewing station, means for receiving said strip adjacent to



said sewing station and for feeding a label therefrom into and through said sewing station, and cutting means operating in conjunction with said label feed rod to sever in sequence with the continuous reciprocation of the feed rod individual labels from said strip immediately prior to an individual label being fed into said sewing station.

4,333,410

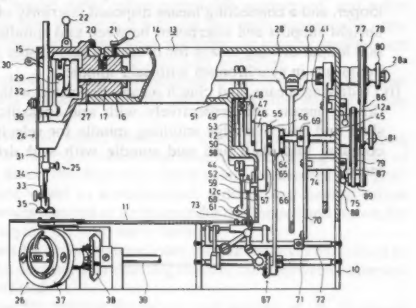
SEWING MACHINE

Bunsaku Taketomi, 56-141 aza-Ishikane, ohaza-Iwasaki, Nisshin-cho, Aichi-gun, Aichi-ken, Japan

Continuation of Ser. No. 951,709, Oct. 13, 1978, abandoned. This application Mar. 10, 1980, Ser. No. 128,983

Int. Cl.³ D05B *1/14, 1/20*

U.S. Cl. 112—162 **7 Claims**



1. In a sewing machine of the kind having:

(a) a bed

(b) an arm frame opposed to said bed and positioned above said bed and disposed substantially parallel with said bed,

(c) a support extending upright from said bed to support one end of said arm frame,

(d) an upper lockstitch mechanism including a needle bar located at a free end of said arm frame,

(e) a lower lockstitch mechanism disposed below said upper lockstitch mechanism and within said bed,

the improvement which comprises:

(i) an overedge stitching mechanism disposed within said upright support between said bed and said arm frame,

(ii) said arm frame comprises an arm frame body fixed to said upright support, and a head connected to a free end of said arm frame body and provided with said upper lockstitch mechanism, means selectively rotatably connecting said head with respect to a longitudinal axis of said arm frame body so as to permit said needle bar in said lock-stitching mechanism to be rotated about said axis in a cloth feed

direction, whereby said head can be selectively rotated toward and away from said lower lockstitch mechanism.

7. A sewing machine comprising:

(i) a frame of generally horizontal U-shape and including a bed, an arm frame disposed opposite said bed and substantially parallel above said bed, and an upright support extending from said bed to support one end of said arm frame, said support including a wall formed with a recess adjacent said bed,

(ii) a lockstitching means comprising a needle support bar disposed at a free end of said arm frame and movable up and down, a needle mounted at the lower end of said needle bar, and disposed opposite said recess, an arm shaft positioned substantially horizontally within said arm frame, means connecting said arm shaft and said needle support bar for moving said bar up and down, a shuttle disposed in said bed at a position at which said needle enters said bed, a shuttle driving shaft disposed interiorly of said bed and connected to said shuttle for driving said shuttle, and a connecting means disposed interiorly of said upright support and interposed between said arm shaft and said shuttle driving shaft for rotating said shuttle driving shaft in synchronism with said arm shaft,

(iii) an overedge stitching means comprising a needle support bar extending through an upper part of said wall bounding said recess, said bar being movable up and down, a needle mounted on the lower end of said needle support bar, a spindle disposed interiorly of said upright support, means connecting said spindle and said needle support bar for moving said bar up and down, a looper mounted movably in said bed and disposed at at position in which said overedge stitching needle moves downwardly in said recess, a looper driving means disposed interiorly of said bed and connected to said looper for driving said looper, and a connecting means disposed interiorly of said upright support and interposed between said spindle and said looper driving means for operating said looper driving means in synchronism with said spindle,

(iv) a driving means, and clutch means associated with said driving means and respectively with said lockstitching shaft and said overedge stitching spindle for selectively coupling said shaft and said spindle with said driving means.

4,333,411

BOBBIN THREAD LEVEL DETECTION AND DISPLAY ARRANGEMENT FOR A SEWING MACHINE

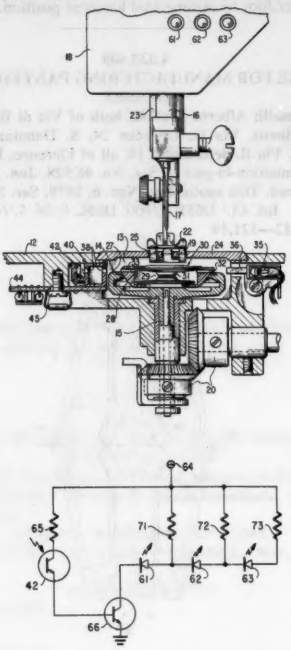
David A. Lerner, Flushing, N.Y., assignor to The Singer Company, Stamford, Conn.

Filed Jul. 15, 1981, Ser. No. 283,403
Int. Cl.³ D05B *45/00, 59/00*
U.S. Cl. 112—278 **3 Claims**

1. A sewing machine having a frame including a bed, said bed having a cavity for receiving a loop taker, a loop taker rotatably supported in said cavity, a bobbin case supported in said loop taker against rotation therewith, said bobbin case freely supporting a lower thread carrying bobbin therein, and means for sensing the thread carrying condition of said bobbin, said sensing means including a light source and a light detector, wherein the improvement comprises:

a display device including a plurality of light emitting elements positioned in a regular array; and

energizing means responsive to the amount of light impinging on said light detector for controlling the energization of said plurality of light emitting elements to produce a



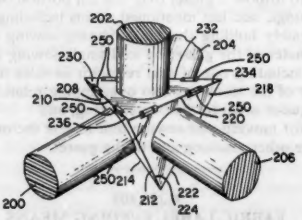
visible light pattern in said display device that is related to the thread carrying condition of said bobbin.

4,333,412

SPAR JUNCTURE STRUCTURE FOR WIND PROPELLED CRAFT

Quentin M. McKenna, 2 Ave de la Boussole, Port La Galere, Theoule-sur-Mer, 06590, France

Filed Sep. 26, 1980, Ser. No. 191,327
Int. Cl.³ B63B *35/00*
U.S. Cl. 114—39 **4 Claims**



1. A wind propelled craft adapted to move over a surface comprising:

three substantially equidistantly spaced support members adapted to engage and be supported on the surface,

four substantially rigid spars connected together at a juncture and extending radially outward therefrom, each of said spars forming an angle of about 110° with each of the other spars, said spars having ends distal from the juncture,

a plurality of substantially equilength stays connected to and between each one of said spars and the other spars, respectively, said stays being connected to said spars at points substantially equidistant from said juncture so as to form with said spars a frame of substantially equilateral tetrahedral shape,

one end of each of said spars being formed as three faces of a tetrahedron, wherein said three faces converge at an apex and wherein the faces of the spars at the juncture interfit with each other to form a generally solid assembly at the juncture,

means for movably connecting three of said one ends to the fourth said one end so that said three ends can articulate about said fourth end when certain of said stays are disconnected from the spars,

three of said spars extending generally laterally and downwardly from the juncture and the fourth spar extending vertically upward from the juncture,

said support members being connected to said frame at points near the distal ends of the spars extending laterally and downwardly from the juncture, and

a sail connected to said frame.

4,333,413

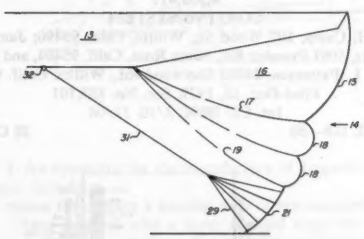
TRANSVERSELY STIFFENED MEMBRANE SEAL

Sydney Davis, Silver Spring, Md., and Alexander Malakhoff, Arlington, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 23, 1980, Ser. No. 114,455

Int. Cl.³ B63B *1/38*

U.S. Cl. 114—67 A **10 Claims**



10. In an air cushion marine vessel of the type having an elongated hull with forward and rear end portions and with spaced depending sidewalls extending generally from the forward portion to the rear portion of the hull to define a plenum chamber therebetween, the improvement in a seal structure for the plenum chamber comprising:

a stiffened lobe seal portion including a membrane section and a plurality of elongated stiffener members connected thereto and extending generally athwartship, transversely across the membrane section; and

support means connected to the longitudinal edge portions of the stiffener members, the support means extending rearwardly of the stiffened lobe portion and connected to the hull of the vessel, and the plurality of stiffener members are arranged in both end-to-end and spaced apart parallel relationship with each other.

4,333,414

SUBMERSIBLE TWIN-HULL WATERCRAFT

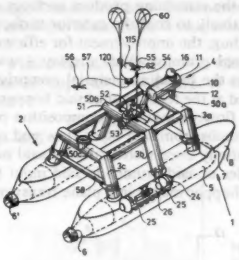
Gerhard Hauz, Waldbronn, Fed. Rep. of Germany, assignor to Gunther Rudi Laukien, Fed. Rep. of Germany

Filed Oct. 22, 1979, Ser. No. 87,001

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1978, 2846154

Int. Cl.³ B63G *8/41*

U.S. Cl. 114—322 **7 Claims**



1. A submersible watercraft, comprising;

a pair of spaced hulls with watertight walls and ballast tanks adapted to be flooded and blown for varying the buoyancy of the craft,

a plurality of tubular members for rigidly interconnecting said hulls, each of the tubular members extending between the hulls and having at least a section which is pressure-resistant and weighing less than the volume of water displaced by the section when it is submerged, so that the watercraft has the stability of a catamaran when surfaced, is weight stable when completely submerged, and when partially submerged with the two hulls substantially completely below the mean waterline the tubular members are at least partly above the mean waterline,

a sealable docking port mounted in one of said tubular members adapted to permit passage into the interior of the watercraft,

a diver-exit vessel detachably connectable to said docking port having a sealable opening for the entering and exit of a diver, the diver-exit vessel being constructed as a pressure vessel to accommodate a diver, and having ballast means adapted to be independently flooded and blown for varying the bouyancy thereof,

means for sealably detachably joining the diver exit vessel to the docking port enabling transfer therebetween underwater, and

means for guiding the ascent and descent of the diver-exit vessel relative to the watercraft comprising a first rope and a second rope, each rope being attached at one end to the watercraft, and in which the diver-exit vessel is fitted with a first eye and a second eye, the two eyes being located respectively at opposite points on a largest horizontal periphery of the diver-exit vessel, the first and the second ropes passing respectively through the first and the second eyes.

4,333,415

APPARATUS FOR DISTRIBUTING AND SIFTING JAPANESE STYLE BREAD CRUMBS IN A TYPICAL BREADING MACHINE FOR COATING EDIBLE FOOD PRODUCTS

Michael E. Miller, Bellevue, and Richard J. Hummel, Sandusky, both of Ohio, assignors to Sam Stein Associates, Inc., Sandusky, Ohio

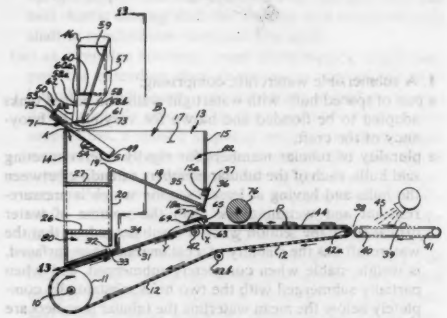
Filed Aug. 7, 1980, Ser. No. 176,024

Int. Cl.³ B05C *19/00*

U.S. Cl. 118—16 **8 Claims**

1. In a breading machine having a conveyor means for mov-

ing a plurality of parallel lines of product to be coated with breading material along a breading or coating path and hopper means wide enough to include said path for discharging breading material at a plurality of zones along said path and wherein said hopper means is operable to discharge breading material onto said conveyor means to form a bottom coating bed upon which the batter coated product to be bread coated is laid whereupon breading material in said bed adheres to the surfaces of said product contacting said bed, and wherein said hopper means is operable to subsequently discharge breading material onto the remaining product surfaces of said product and thus effectively to coat the exterior surfaces of said product with breading; the improvement for efficiently using Japanese style bread crumbs which display a wide variation in crumb sizes as the breading material comprising distribution means disposed at the feed input of said hopper means to intercept an input flow of a normal composition of said Japanese style bread crumbs from said input flow and operable to provide a substantially even distribution of said normal composition of particles of said crumbs in said input flow across the width of said hopper means in a plane transverse to the direc-



tion of travel of product along said coating path, and sifter means disposed between said distribution means and said hopper means and operable to receive said even distribution of said normal composition of particles of said crumbs and also operable to separate said normal composition of said crumbs into a first flow substantially composed of a higher than normal percentage of finer particles of said crumbs mixed with a lower than normal percentage of coarser particles of said crumbs and a second flow substantially composed of a higher than normal percentage of coarser particles of said crumbs mixed with a lower than normal percentage of finer particles of said crumbs, said first flow being directed into a first portion of said hopper means to supply said bottom coating bed on said conveyor means and said second flow being directed into a second portion of said hopper means to supply crumbs to coat said remaining surfaces of said product, whereby each surface of said product may be presented with a well controlled flow of said crumbs in the composition of larger and smaller particles best suited to coat the individual surfaces of said product, and whereby all surfaces of all product pieces may present a nearly identical finished appearance.

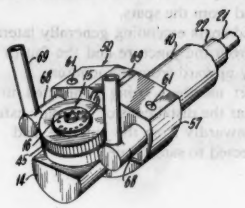
4,333,416

EXTENSION NOZZLE ATTACHMENT FOR A FLAME-SPRAY TORCH

Anthony J. Rotolico, Hauppauge, and Eduardo Romero, Coram, both of N.Y., assignors to Eutectic Corporation, Flushing, N.Y.

Filed Apr. 14, 1980, Ser. No. 140,142
Int. Cl.³ B05C *5/04, 7/02, 7/06*
U.S. Cl. 118—47 **12 Claims**

1. As an article of manufacture, a nozzle attachment for a flame-spray torch for coating within a workpiece bore, said attachment comprising an elongate body with means at one end for removable gas-distributor connection to a gas torch and with a head at the other end for removable nozzle connection, said head having nozzle-mounting means on a nozzle-orienting axis at angular offset with respect to the elongation of said body, first and second independent elongate concentric passages extending the length of said body to said head first for accommodation of a distributor-supplied flow of carrier gas and powder and second for accommodation of a distributor-supplied flow of combustible-gas mixture; a nozzle removably fitted to said head on said offset axis and having a central passage for discharge of carrier gas and powder on the nozzle axis, said nozzle having an angularly spaced plurality of combustible-gas jets concentrically arrayed about the nozzle axis



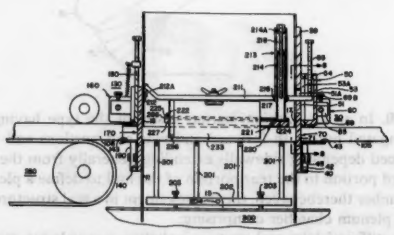
and radially outside said central passage, said head and nozzle having cooperating formations defining an annular-manifold region for supply of said combustible-gas jets, said head having first passage means establishing an independent connection of said first elongate passage to the central passage of said nozzle, and said head having second passage means establishing an independent connection of said second elongate passage to said manifold region; the gas-distributor connection means at said one end including cylindrical formations concentric with said passages, and means on said body for selectively securing said one end to a gas distributor in any desired angular orientation of said offset axis with respect to the axis of concentricity of said formations.

4,333,417

COATING SYSTEM

Neal H. Camp, 107 Wood St., Willits, Calif. 95490; James E. Paetz, 5061 Pressley Rd., Santa Rosa, Calif. 95404, and Nicholas L. Patterson, 24033 Sherwood Rd., Willits, Calif. 95490

Filed Dec. 13, 1979, Ser. No. 103,101
Int. Cl.³ B05C *3/10, 11/06*
U.S. Cl. 118—50 **20 Claims**



1. In a system for continuous application of a liquid coating material onto the surfaces of successive units of material having varying cross-sectional dimensions, a coating chamber substantially closed to the atmosphere for containing a substantial head of liquid coating material, said coating chamber defining an inlet aperture and an outlet aperture therein generally conforming to the dimensions of the largest cross section of material to be coated in said chamber, said apertures being

located on opposite sides of said chamber in substantial alignment with each other and at a level in said chamber where substantial hydrostatic pressure of said liquid coating material will be maintained; port defining means mounted over each of said inlet and outlet apertures for providing entrance and exit ports of adjustable dimensions, each of said port defining means comprising at least one gate, gate mounting means for mounting said gate in sliding relation with one of the edges of an associated aperture, positioning means for setting an initial position of said gate, and spring means for biasing said gate toward said initial position; dimension sensing means positioned inside said chamber for sensing variations in at least one dimension of units of material passing through said chamber and automatically adjusting the position of said slidably mounted gate at said outlet aperture; and means acting continuously above the level of liquid coating material in said chamber to produce a pressure differential between the interior and exterior of said chamber sufficient to induce a continuous flow of air into said chamber about the periphery of portions of material positioned within said entrance and exit ports and upwardly through said liquid coating material in said chamber.

4,333,418

APPARATUS FOR THE PRODUCTION OF MAGNETIC RECORDING MEDIA IN TAPE FORM

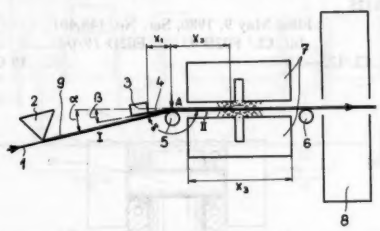
Peter Nagel, Willstaett; Klaus Schoettle, Heidelberg; Reinrich Wittkamp, Mannheim, and Karl Hauck, Maxdorf, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 815,929, Jul. 15, 1977, which is a continuation of Ser. No. 711,822, Aug. 5, 1976, abandoned. This application Mar. 28, 1980, Ser. No. 135,913

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1975, 2535092

Int. Cl.³ B05C *11/02*

U.S. Cl. 118—106 **4 Claims**



1. An apparatus for the manufacture of magnetic recording tape, including:

means for coating a moving web of non-magnetizable tape base material with a layer of fluid magnetic dispersion comprising a mixture of anisotropic magnetic particles in a binder,

a deflecting roll disposed downstream of said coating means,

means for conveying said web past said coating means upwardly towards said deflecting roll in an inclined plane, said deflecting roll causing said web to change direction to a horizontal plane,

a magnetic orienting device disposed downstream of said deflecting roll and having at least one pair of poles adjacent said horizontal plane, the poles of said pair extending perpendicularly to and being spaced lengthwise of said web so as to orient said magnetic particles in a direction parallel to the surface of the web,

a flexible blanket mounted between the coating means and the magnetic orienting device so as to provide a portion in sliding contact with the magnetic layer,

the first line of contact of the blanket with said layer being near the deflecting roll and the length of the blanket being so correlated with the position of said magnetic orienting device that the blanket extends to a point between said lengthwise spaced poles, and

drying means disposed downstream of the last-mentioned point.

4,333,419

METHODS AND DEVICE FOR CLADDING ELONGATED OBJECTS SUCH AS WIRES AND THE LIKE WITH POWDERED MATERIAL

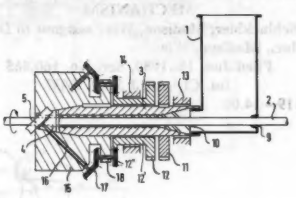
Walter Hufnagl, Lommelstrasse 9, 8 München 71, Fed. Rep. of Germany, and Peter Kotauczek, Weissperberl. 38, 1030 Wien, Austria

Filed Nov. 8, 1978, Ser. No. 958,882

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1977, 2750369

Int. Cl.³ B05C *3/02*

U.S. Cl. 118—405 **28 Claims**



1. A device for cladding elongated objects, such as wires and the like with a powdered material, comprising a storage container for the powdered material, said storage container being adapted to receive the elongated object; a rotary internal worm conveyor having an internal surface, an inlet communicating with said container and an outlet provided with a nozzle, said elongated object to be clad being fed through said internal surface of said conveyor to provide continuous applying of the powdered material onto the surface of the object during the feeding of the latter; and at least one set of rotary pressing rollers arranged at the outlet of said nozzle and each having an axis of rotation positioned at an acute angle with the direction of feeding of the elongated object to thereby obtain on said elongated object the compacted powdered layer with bonded portions having spiral-like form and overlapping each other.

4,333,420

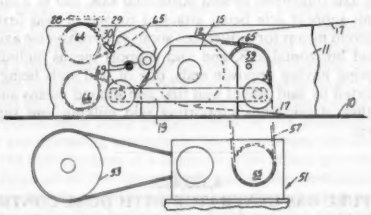
GLUE APPLICATOR

Nello J. Petri, 1450 Bancroft Ave., San Francisco, Calif. 94124

Filed Jul. 21, 1980, Ser. No. 170,540

Int. Cl.³ B05C *5/02*

U.S. Cl. 118—411 **6 Claims**



1. In combination with a moving web of paper or the like, a glue applicator for applying glue to said moving web comprising:

a glue pump including a housing therefor,

said housing being formed with an inlet for glue and a discharge nozzle,

means mounting said housing in close proximity to said web with said discharge nozzle positioned for applying the discharged glue directly from said nozzle to said moving web,

a rotating member associated with said moving web and rotating at a speed proportional to the speed of said web,

a rotatable rod of noncircular cross section for driving said pump,

said pump including a driven gear formed with a through opening having a cross section complementary to the cross section of said rotatable rod and receiving the latter therethrough,

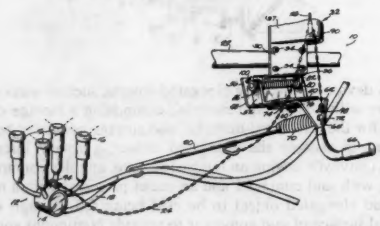
means interconnecting said rotating member and said rod for driving said pump at a speed proportional to the speed of said moving web.

4,333,421

MILKING UNIT SUPPORT AND DETACHER MECHANISM

Gary W. Schluckbier, Madison, Wis., assignor to DEC International, Inc., Madison, Wis.

Filed Jun. 18, 1980, Ser. No. 160,465
Int. Cl.³ A01J *5/04, 7/00*
U.S. Cl. 119—14.08 **13 Claims**



8. A milking unit support and detacher mechanism for supporting a milking unit when the milking unit is attached to a cow for milking, said milking unit having a teat cup assembly and at least one hose member extending from said assembly, the milking unit support and detacher mechanism comprising:

a milking unit support arm movable between a first position wherein said arm extends downwardly and a second position wherein said arm extends outwardly, said milking unit support arm having a free end engageable with said hose member in spaced relation to said teat cup assembly for supporting said milking unit when the milking unit is attached to a cow for milking and when said arm is in said second position; and

support means for said milking unit support arm including first means disposed for rotation about a horizontal axis and second means disposed for pivotal movement about an axis transverse to said horizontal axis, and said milking unit support arm being attached to one of said first and second means for movement about said transverse axis and said horizontal axis, and said support means including a spring having opposite ends, one of said ends being supported by said one of said first and second means and the other of said ends supporting said milking unit support arm.

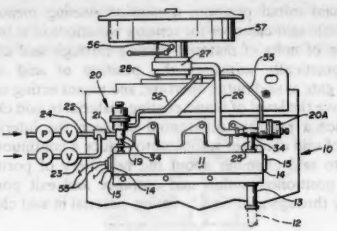
4,333,422

HOT FUEL GAS GENERATOR WITH DUAL CONTROLS

Fred G. Mahoney, 509 Dorseyville Rd., Pittsburgh, Pa. 15238

Filed Aug. 27, 1980, Ser. No. 181,878
Int. Cl.³ F02B *43/00*
U.S. Cl. 123—3 **6 Claims**

1. A generator for producing hot fuel gas for an internal combustion engine having intake and exhaust manifolds, said generator comprising a heat exchanger positioned through said exhaust manifold, the heat exchanger comprising a tubular member having inner and outer surfaces, means closing the ends of said tubular member, an elongated body member positioned in said tubular member in continuous engagement with said inner surface thereof, the exterior of said body member having a continuous spiral configuration therein forming an elongated continuous spiral passageway, means for introducing liquids to be gasified into one end of said spiral passageway and means communicating with the other end thereof for



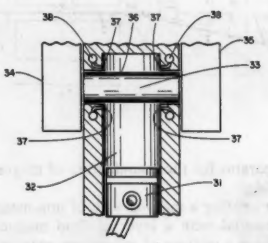
receiving gasified fuel therefrom valves in communication with said means for introducing said liquids and receiving said gasified fuel, a supply source of said liquids in connection with one of said valves and means establishing communication between the other of said valves and said intake manifold, means for actuating said valves simultaneously, said valve actuating means responsive in operation to inlet manifold pressure changes when said internal combustion engine is operating.

4,333,423

ENGINE STEAM STRATIFIER

Joseph C. Firey, P.O. Box 254 Northgate Sta., Seattle, Wash. 98125

Filed May 9, 1980, Ser. No. 148,401
Int. Cl.³ F02B *45/02;* **F02D** *19/04*
U.S. Cl. 123—23 **18 Claims**



1. The combination of a solid carbon burning internal combustion engine comprising:

at least one cylinder and at least one and at most two pistons with piston crowns operative within each of said cylinders, each of said cylinders comprising a combustion chamber space fully enclosed by a portion of the interior walls of said cylinder and the crowns of said pistons when said pistons are at that position creating the smallest such fully enclosed space during the engine compression process;

means for placing solid carbon fuel and the pore spaces therein within a fractional portion of each of said combustion chamber spaces, said fractional portion exceeding zero and not exceeding one, so that a major portion of said solid carbon remains within said combustion chamber through several engine cycles,

each of said cylinders further comprising at least one solid,

non carbon piece, said solid piece and any non carbon pore spaces therein being stationary with respect to said cylinders and occupying a fractional portion, which is less than one and exceeds zero, of said combustion chamber space;

each of said combustion chamber spaces being large enough to contain said solid carbon fuel and the pore spaces therein when placed within said combustion chamber, said solid non carbon stationary pieces and the non carbon pore spaces therein, and a clear non pore space free of solid material, said clear space being a fractional portion, which is less than one and may be zero, of said combustion chamber space;

wherein the improvement comprises adding to said solid carbon burning engine at least one engine steam stratifier comprising:

means for supplying steam;

means for delivering said steam equally into each engine cylinder commencing after commencement of the engine intake process, and stopping prior to the end of the engine compression process;

whereby the solid carbon pore temperatures within said combustion chamber can be reduced.

4,333,424

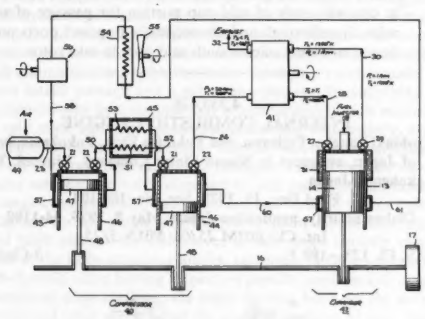
INTERNAL COMBUSTION ENGINE

Richard McFee, R.D. #1, Union Springs, N.Y. 13160

Filed Jan. 29, 1980, Ser. No. 116,456

Int. Cl.³ F02B *33/00*

U.S. Cl. 123—39 **14 Claims**



1. An internal combustion engine comprising

an air compressor for receiving and compressing a flow of air to a given pressure and temperature;

a heat exchanger defining a first flow path for receiving a pressurized flow of air from said compressor and a second flow path for receiving a flow of hot gas in heat exchange relation with said first path to heat the flow in said first flow path to a higher second temperature while cooling the flow in said second flow path;

at least one expander having a cylinder, a piston reciprocally mounted in said cylinder for movement in a power stroke and an exhaust stroke, an inlet valve connected to said first flow path of said heat exchanger to direct a flow of compressed air at said second temperature into said cylinder during an intake phase of said power stroke while allowing the pressure of the air to reduce to atmospheric during a subsequent expansion phase of said power stroke, and an outlet valve connected to said second flow path of said heat exchanger to deliver an expanded flow of air at said second temperature from said cylinder to said second flow path during said exhaust stroke;

first means for injecting fuel into said cylinder during said expansion phase of said power stroke in an amount adequate to maintain the temperature of the air therein at or above the temperature of the air upon entry therein during said intake phase; and

second means connected to said piston for absorbing and storing the energy of each expansion stroke of said piston for subsequent use.

4,333,425

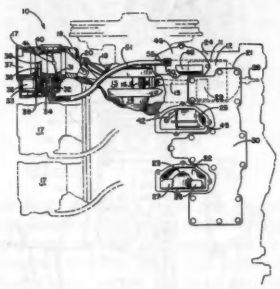
FUEL SYSTEM FOR A TWO-CYCLE ENGINE

David W. Kusche, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 29, 1980, Ser. No. 220,386

Int. Cl.³ F02B *33/04*

U.S. Cl. 123—73 R **10 Claims**



1. A fuel system for a two-cycle, crankcase compression engine having a cylinder block, a cylinder, a piston reciprocable in said cylinder, a crankcase, a transfer passage for transferring air-fuel mixture from said crankcase to said cylinder and an exhaust port for removing combustion gases from said cylinder, said fuel system comprising:

(A) a main inlet passage for supplying an air-fuel mixture to said crankcase;

(B) a main valve for shutting off said main inlet passage at idle speeds; and

(C) an idle inlet passage for supplying an idle air-fuel mixture directly to said transfer passage.

4,333,426

INTERNAL COMBUSTION ENGINE CONSTRUCTION

John M. Gavasso, Farmington Hills; Louis G. Bodnar, Westland, and Walter E. Parker, Plymouth, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

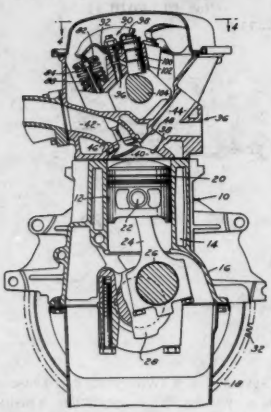
Filed Jan. 4, 1980, Ser. No. 109,721

Int. Cl.³ F02C *1/02*

U.S. Cl. 123—90.27 **1 Claim**

1. A low emission output internal combustion engine construction comprising a cylinder block having a plurality of cylinder bores therein, and a cylinder head secured over the block and having adjacent each cylinder bore a hemispherically shaped recess together with the adjacent cylinder bore defining a combustion chamber having a hemispherical surface facing the adjacent cylinder bore, each surface having an inlet valve and an exhaust valve therein, the longitudinal centerlines of the valves each being perpendicular to the hemispherical surface and extending towards the bore to intersect the centerline of the cylinder bore at a common point effecting a seating of the faces of all the valves flush against the hemispherical surface to thereby provide a minimum surface area exposed to combustion chamber hydrocarbon buildup, valve train means for reciprocating the valves comprising a single camshaft centrally mounted on the cylinder head having a plurality of axially spaced cams thereon, a plurality of pivotal rocker arms each stud mounted on the cylinder head and engaged at one end by tappet means engaged with a cam on the camshaft and engaged at the opposite end with the end of a valve, the inlet and exhaust valves being symetrically located on opposite sides

of the camshaft, and spring means biasing each valve to a closed position with the valve face flush with the hemispherical surface, the longitudinal centerlines of the tappet, rocker arm stud and valve of each valve train together intersecting at a common point and being contained and movable in a single plane that is both oblique to the rotational axis of the camshaft and canted to lie at an angle between the horizontal axis of rotation of the camshaft and the vertical axis of the cylinder bore, whereby each valve longitudinal centerline then will intersect the hemispherical surface in a perpendicular manner locating the valve flush therewith and with the valve centerline intersecting the surface at a point other than on the longitudinal and transverse centerlines of the surface,



each rocker arm includes said stud mounting the rocker arm for independent attitude with respect to the other rocker arms and a semicylindrical fulcrum secured to the stud engageable with the rocker arm preventing rotation of the rocker arm about the longitudinal axis of the stud to maintain movement of the valve train in the single plane, and

each port being offset with respect to the longitudinal and transverse centerlines of the cylinder bore, the inlet valve port overlapping the centerline of the cylinder bore.

4,333,427

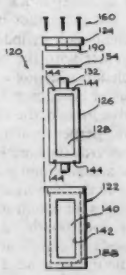
INTERNAL COMBUSTION ENGINE

Antonio Burillo, 127 Monterey Rd., S. Pasadena, Calif. 91030, and Richard Dane, II, Alhambra, Calif.

Filed Aug. 5, 1980, Ser. No. 175,585

Int. Cl.³ F01L *7/00*

U.S. Cl. 123—190 A **8 Claims**



1. In an internal combustion engine having a plurality of combustion chambers:

an inlet lower cover portion having a first set of inlet ports communicating with respective ones of said combustion chambers;

an inlet upper cover having a second set of inlet ports respectively aligned, in operation, with said first set of inlet ports in said inlet lower cover portion;

an exhaust lower cover portion having a first set of exhaust ports equal in number to the number of said combustion chambers and communicating with respective ones thereof;

an exhaust upper cover having a second set of exhaust ports respectively aligned, in operation, with said first set of exhaust ports;

an intake valve shaft assembly including a plurality of rotary valves supported to communicate, in a predetermined time sequence, between the ports in said first set of inlet ports and respective ones of the ports in said second set of inlet ports;

an exhaust valve shaft assembly including a plurality of rotary valves supported to communicate, in a predetermined time sequence, between respective ones of said ports in said first and second sets of exhaust ports;

means for driving said intake and exhaust valve shaft assemblies synchronously with respect to each other;

said inlet and exhaust valve shaft assemblies being segmented between adjacent rotary valves;

each of said rotary valves including a rotor portion having a port passing diametrically therethrough, said rotor portion terminating in a pair of axles, and a cylindrical cap portion having inner and outer surfaces and being coaxial with and enclosing said rotor portion except for openings at opposite ends of said cup portion for passage of said axles therethrough and diametrically opposed ports positioned to communicate with said port in said rotor.

4,333,428

INTERNAL COMBUSTION ENGINE

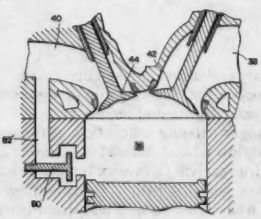
Toshiaki Tanaka, Fujisawa, and Yukihiro Etoh, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 19, 1979, Ser. No. 105,104

Claims priority, application Japan, May 8, 1979, 54-1189

Int. Cl.³ F02M *25/06*; F01N *3/15*

U.S. Cl. 123—198 F **3 Claims**



1. An internal combusion engine comprising:

(a) first and second cylinder units each including at least one cylinder having a combustion chamber defined by a cylinder block and a cylinder head mounted on said cylinder block, each of said combustion chambers being connected through an exhaust valve to an exhaust port formed in said cylinder head;

(b) a bypass passage associated with each cylinder of said second cylinder unit, said bypass passage opening at its one end into said exhaust port and at the other end into said combustion chamber providing communication therebetween to bypass said exhaust valve;

(c) a bypass valve provided in said bypass passage, said bypass valve being normally in its closed position to inter-

rupt communication between said exhaust port and said combustion chamber; and

(d) control means responsive to engine low load conditions for disabling said second cylinder unit and placing said bypass valve into its open position to provide said communication between said exhaust port and said combustion chamber.

4,333,429

INTERNAL COMBUSTION ENGINE

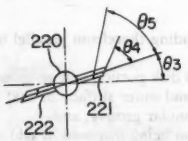
Masahiko Iiyama, Tokyo; Tsugio Sanka, Wako, and Kenji Naito, Kamifukuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 48,468, Jun. 14, 1979, abandoned. This application Nov. 20, 1980, Ser. No. 208,840

Claims priority, application Japan, Jun. 15, 1978, 53-72421; Jun. 15, 1978, 53-72422; Jun. 15, 1978, 53-72424

Int. Cl.³ F02B *19/10*

U.S. Cl. 123—274 **7 Claims**



1. In a multi-cylinder internal combustion engine having, for each cylinder provided with a reciprocal piston therein, a main combustion chamber defined above the piston and a sub-combustion chamber defined above said main combustion chamber and communicating with the latter through a torch nozzle, a main intake passage and a sub-intake passage for supplying a comparatively lean mixture and a comparatively rich mixture to said main and sub-combustion chambers, respectively, said carburetor comprising a single throttle valve shaft extending across said main and sub-intake passages, a main throttle valve and a sub-throttle valve disposed in said main and sub-intake passages, respectively, said main and sub-throttle valves being attached to said single throttle valve shaft, means attaching said main and sub-throttle valves to said single throttle valve shaft at the same attaching angles, said main throttle valve and sub-throttle valve having respective parallel surfaces and outer peripheral edge surfaces, the angle formed between the outer peripheral edge surface and the parallel surfaces of said main throttle valve and the angle formed between the outer peripheral edge surface and the parallel surfaces of said sub-throttle valves being different from one another so that the ratio of the open areas of said main and sub-intake passages is not constant as said throttle valve shaft is operated.

4,333,430

ENGINE BRAKE

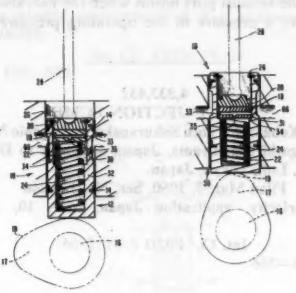
Von D. Rosquist, P.O. Box 161, Levan, Utah 84639

Filed Jun. 15, 1979, Ser. No. 48,988

Int. Cl.³ F02D *9/06*

U.S. Cl. 123—321 **7 Claims**

1. In an engine brake for use with an internal combustion engine having an engine block, a cam shaft, a combustion chamber, a valve in said combustion chamber, a valve operating mechanism between said cam shaft and said valve for operating said valve in response to rotation of said cam shaft, said valve operating mechanism including an actuator, said actuator having a normal extended position in which said valve normally opens and closes during engine operation and a collapsed position in which said valve is only partially opened, means for supplying a pressurized fluid to said actuator to shift said actuator between its normal extended and collapsed positions, whereby said actuator when in its normal extended position opens and closes said valve in response to cam shaft rotation and said engine operates as a power producer and when in its collapsed position said valve is only partially opened by said actuator and said engine operates as an energy dissipator for braking purposes, a fluid pump driven by an electric motor, said pump for delivering pressurized fluid to said actuator, the improvement wherein:



said electric motor includes a pinion gear adapted to engage an engine flywheel ring gear, means for engaging said pinion gear with said ring gear, and means for electrically connecting said motor to the storage battery of a vehicle, whereby said motor may be employed to drive said pump while driving said pinion gear in engagement with said engine flywheel ring gear.

4,333,431

WATER-COOLED TWO STROKE ENGINE HAVING EXHAUST PORT TIMING CONTROL VALVE MEANS

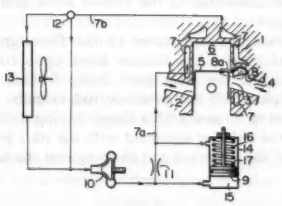
Toshimitsu Iio, Hamamatsu, and Yuusaku Yamaoka, Iwata, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed Oct. 1, 1980, Ser. No. 192,860

Claims priority, application Japan, Oct. 17, 1979, 54-133863

Int. Cl.³ F02B *75/02*

U.S. Cl. 123—323 **5 Claims**



1. A water-cooled two stroke engine comprising cylinder means having cylinder wall means formed with exhaust port means, piston means provided in said cylinder means for reciprocating movement so that the exhaust port means is cyclically closed by the piston means, said exhaust port means being provided at an upper portion thereof with exhaust port timing control valve means, cooling water jacket means formed in said cylinder means, cooling water passage means having restriction means and leading to said jacket means for providing a supply of cooling water to said jacket means, actuator means for moving the valve means under a low engine speed to a position wherein it covers the upper portion of the exhaust port means so that exhaust port opening timing is retarded, said actuator means comprising pressure responsive movable means, operating pressure chamber means defined at one side of the movable means for applying said movable means with a

pressure in said cooling water passage means upstream of the restriction means, and compensating pressure chamber means defined at the opposite side of the movable means for applying the movable means with a pressure in said cooling water passage means downstream of the restriction means, said movable means being connected with said valve means so that the valve means is moved to a position wherein it uncovers the upper portion of the exhaust port means when the movable means is moved under a pressure in the operating pressure chamber means.

4,333,432

FUEL INJECTION PUMP

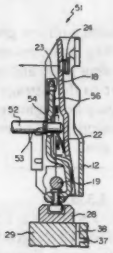
Masayoshi Kobayashi; Toru Sakuranaka, and Sachio Nakagawa, all of Higashi Matsuyama, Japan, assignors to Diesel Kiki Company, Ltd., Tokyo, Japan

Filed Mar. 3, 1980, Ser. No. 126,246

Claims priority, application Japan, Mar. 10, 1979, 54-29886[U]

Int. Cl.³ F02D *1/04, 1/06*

U.S. Cl. 123—366 **3 Claims**



1. A fuel injection pump including a pin, a start lever rotatable about the pin, a tension lever rotatable about the pin, a start spring urging the start lever away from the tension lever, engine driven flyweights urging the start lever toward the tension lever when rotated, a governor spring urging the tension lever toward the start lever and a fuel control member operatively connected to the tension lever, characterized by comprising:

a governor rod connected to the flyweights and being moved toward the tension lever upon rotation of the flyweights, the start lever being formed with a hole through which the governor rod extends, the governor rod being formed with a flange having a diameter larger than the hole for abutment with the start lever before an end of the governor rod abuts against the tension lever.

4,333,433

ELECTRONIC IGNITION SYSTEM WITH MECHANICAL ADVANCE

Richard W. Mattson, Rossford, Ohio, assignor to Eltra Corporation, Toledo, Ohio

Filed Mar. 17, 1980, Ser. No. 130,898

Int. Cl.³ F02P *5/04, 7/02*

U.S. Cl. 123—420 **11 Claims**

1. An ignition controller, comprising:

a rotatable shaft;

trigger rotor means operably connected to said shaft and movable therewith;

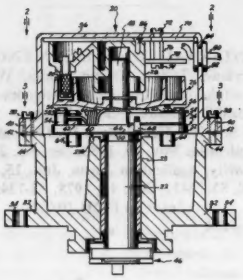
carrier means for supporting a sensing means;

said sensing means being affixed to said carrier means, and supplying an ignition control signal responsive to rotation of said shaft;

said carrier means including means for rotatably engaging said shaft and being located thereby;

whereby said trigger rotor means and said sensing means are referenced to said shaft and to each other;

said trigger rotor means including a first disk portion, said disk portion having a first wall portion perpendicular thereto peripheral to said disk portion and having a second wall



portion protruding therefrom parallel to said first wall portion;

a portion of said disk portion and an inner surface of said first wall portion and outer surface of said second wall portion defining an annular groove; and

a metallic portion being disposed in said annular groove.

4,333,434

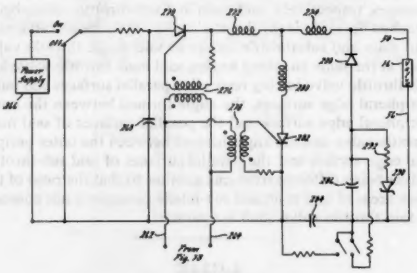
FUEL INJECTION SYSTEM, CONTROL VALVE AND ELECTRONIC CONTROL CIRCUIT

Ellsworth G. Brunais, Mt. Clemens, and Jay C. McCombie, West Bloomfield, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Oct. 31, 1977, Ser. No. 846,737

Int. Cl.³ F04B *41/06;* **B05B** *1/30;* **F02M** *51/00*

U.S. Cl. 123—478 **4 Claims**



1. A fuel injection control system comprising:

a control valve including a piezoelectric stack for actuating the valve;

a control circuit for controllably energizing said stack comprising a source of DC potential, means for selectively connecting said source of DC potential to said stack including a charge circuit path via which said stack is charged from said source, said charge circuit including two series-connected inductances, and a discharge circuit for discharging said stack, said discharge circuit including one of said series-connected inductances and a third inductance, said one of said two series-connected inductances and said third inductance being connected in series, and further including energy storage means associated with said charge and discharge circuits for storing some of the energy from the stack via said one of said two inductances and said third inductance during stack discharge

and for returning some of the stored energy to the stack via said first two series-connected inductances during charging of the stack.

4,333,435

FUEL INJECTION DEVICE

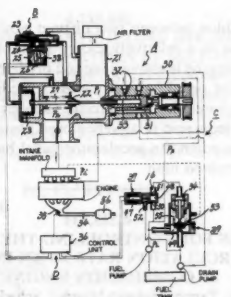
Tsugito Nakazeki, Iwata, and Haruhisa Harada, Kakegawa, both of Japan, assignors to NTN Toyo Bearing Company, Limited, Osaka, Japan

Filed Mar. 23, 1979, Ser. No. 23,281

Claims priority, application Japan, Apr. 24, 1978, 53/48868

Int. Cl.³ F02D *3/00, 5/02*

U.S. Cl. 123—489 **2 Claims**



1. An apparatus for controlling the air-fuel mixture of an internal combustion engine comprising:

a control mechanism for actuating a solenoid valve between opened and closed positions, said control mechanism including a triangular-wave generator capable of generating a triangular wave having a fixed amplitude and a fixed period and a comparing unit means for receiving said triangular wave and comparing said triangular wave with electrical signals received from a plurality of sensor means disposed within said engine;

a pressure regulating means connected to a fuel line of said engine, said pressure regulating means prescribing a pressure difference across a fuel metering gate, said solenoid valve being disposed so as to regulate signals between said control mechanism and said pressure regulating means, thereby adjusting said pressure regulating means in response to said electrical signals originating from said plurality of sensor means;

a fuel flow rate measuring and distributing means disposed in said fuel line and having said fuel metering gate disposed therein;

a throttle valve disposed within a suction pipe, said throttle valve regulating air flow into said engine;

an air flow rate detecting valve disposed within said suction pipe, said air flow rate detecting valve being connected to said fuel metering gate;

a servo-mechanism connected to said control mechanism, said servo-mechanism providing a constant pressure difference across said air flow rate detecting valve disposed within said suction pipe, whereby the air fuel ratio supplied to said engine is maintained at a desired constant value.

4,333,436

SERVO OPERATED INJECTION NOZZLE-PUMP COMBINATION WITH CONTROLLED RATE OF SERVO PRESSURE CHANGE

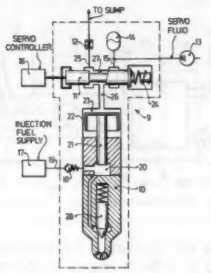
Odon Kopse, Stuttgart, and Kurt Ziesche, Remseck, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 9, 1979, Ser. No. 10,619

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1978, 2806788

Int. Cl.³ F02M *39/02*

U.S. Cl. 123—502 **12 Claims**



1. Fuel injection nozzle-pump combination for an internal combustion engine having

a nozzle body (**10**) formed with nozzle openings therein;

a fuel chamber (**20**) in said nozzle body;

a source of fluid fuel (**17**) in fuel communication with the chamber and providing a predetermined quantity of fuel thereto;

a pump piston (**21**) positioned in said body to exert pressure on the fuel fluid in said chamber and effect injection of fuel from the nozzle openings;

a source of pressurized servo fluid (**13, 14, 15**);

a servo fluid cylinder (**23**), said pump piston being subjected to pressure in said cylinder (**23**);

a control valve including a valve housing and a movable valve element (**41, 51, 81**) providing a fluid flow path for pressurized servo fluid and controlling by means of control edges admission of pressurized servo fluid from said source to said cylinder, said control valve having control edges (**33, 37, 44, 96**) at adjacent locations of said valve housing and movable valve element which form a throttle for fluid flow upon initial displacement of the movable element;

servo control means (**16**) controlling the positioning of the movable valve element of said control valve to thereby control, selectively, admission of said pressurized servo fluid to the cylinder and hence movement of the piston (**21**) into the fuel chamber to inject fuel from the nozzle openings

and wherein said valve, in addition to said control edges (**33, 34, 37 34**) further comprises additional throttle means (**43, 48, 57, 86**) forming a hydraulic choke or throttle for hydraulically choking or throttling the servo fluid, said additional throttle means being inserted in the servo fluid flow path upon initial displacement of the movable valve element (**41, 51, 81**) from a position blocking the fluid flow path to a position establishing an open unconstricted fluid flow path from the source of pressurized servo fluid (**13, 14, 15**) to the servo cylinder (**23**) to provide for initial controlled throttling of flow of the servo fluid being admitted to the servo cylinder and hence gradual buildup of pressure of the servo fluid acting on the pump piston (**21**) upon commencement of fuel injection.

4,333,437
TIMING CONTROL APPARATUS FOR FUEL INJECTION PUMP

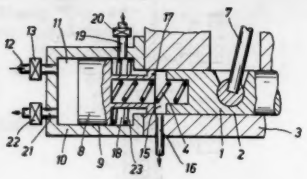
Ingolf Löhner, Brunswick; Konrad Barnert, and Günter Stein, both of Wolfsburg, all of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Division of Ser. No. 894,944, Apr. 10, 1978, abandoned. This application Sep. 30, 1980, Ser. No. 192,617

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1977, 2716307

Int. Cl.³ F02M *59/32*

U.S. Cl. 123—502 **2 Claims**



1. Apparatus for regulating the injection timing of a fuel injection pump in a diesel engine in accordance with engine temperature and speed, comprising:

(a) means for supplying a first fluid pressure proportional to engine speed;

(b) means for supplying a second fluid pressure, controlled according to engine temperature, including a source of said pressure and a valve;

(c) a first piston movably mounted in a cylinder and acted upon by said first fluid pressure;

(d) an actuating member connecting said piston to said fuel injection pump for advancing the injection timing of said pump upon movement of said first piston by said first fluid pressure;

(e) a spring means urging said first piston against said first fluid pressure; and

(f) a spring tension adjusting means comprising a movable control element engaging one end of said first spring means and acted upon by said second controlled fluid pressure to move in the direction of said first spring means thereby increasing said spring force against said first piston;

said apparatus further comprising a second piston movably mounted in a second cylinder and connected to an idle stop, a second spring means urging said second piston and said idle stop to an advanced idle position, and means for providing said second controlled fluid pressure to said second cylinder to act on said second piston in opposition to said second spring means and thereby to move said idle stop out of said advanced idle position.

4,333,438
DEVICE FOR RECYCLING EXHAUST GASES FOR A DIESEL ENGINE

Jean Perez, Rueil, and Jean-Claude Carnus, Paris, both of France, assignors to Automobiles Peugeot and Societe Anonyme Automobiles Citroen, both of Paris, France

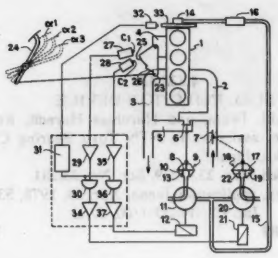
Filed Mar. 5, 1979, Ser. No. 16,949

Claims priority, application France, Mar. 22, 1978, 78 08335; Dec. 5, 1978, 78 34233

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—569 **22 Claims**

1. A device for recycling exhaust gases for a Diesel engine comprising an induction pipe having a throttle member therein, an exhaust pipe, a connecting pipe interconnecting the induction pipe and the exhaust pipe, a closure member inserted in the connecting pipe, an accelerator pedal for the engine, said connecting pipe being connected to the induction pipe downstream of the throttle member relative to flow through the induction pipe, control means including closure means for activating the closure member to prevent recycling when the speed of the engine is below a first predetermined non zero value and also when the accelerator pedal passes beyond a first predetermined limit; said control means further including throttle means for switching the throttle member to pass in a



step-wise fashion between two distinct positions, a relatively open position to a relatively closed position, when both the speed of the engine is above a second predetermined value and the accelerator pedal has not passed a second predetermined limit and for switching the throttle member to pass in a step-wise fashion from said relatively closed position to a relatively open position when the accelerator pedal has passed said second predetermined limit.

4,333,439
APPARATUS FOR CONTROLLING THE EXHAUST GAS RECIRCULATION RATE IN AN INTERNAL COMBUSTION ENGINE

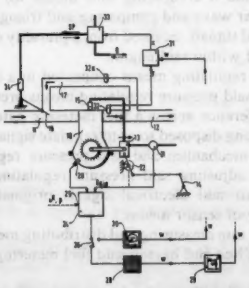
Klaus Müller, Tamm; Helmut Maurer, Schwieberdingen; Franz Rieger, Aalen, and Ernst Linder, Mühlacker, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 4, 1980, Ser. No. 127,158

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1979, 2911209

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—569 **9 Claims**



1. A system for controlling exhaust gas recirculation rate in an internal combustion engine having an auto-ignition comprising:

an air intake manifold;

an exhaust manifold;

an exhaust recirculation line extending from said exhaust manifold to a junction with said air intake manifold;

a mixture valve in an area of the junction of said exhaust circulation line with said air intake manifold;

control means for controlling positions of said mixture valve relative to said junction and said air intake manifold;

a data detection apparatus for detecting different operational variables of said engine and producing an output signal in accordance with said operational variables;

set-point value means for receiving said output signal from said data detection apparatus, said means producing an output signal representing given set-point values;

at least one oxygen sensor for producing an output signal corresponding to oxygen concentrations;

a closed-loop control apparatus for receiving said set-point values from said means for receiving output signals from said data detection apparatus and from said at least one oxygen sensor, said closed-loop control apparatus having an output related to said set-point values and oxygen concentration;

a converter means for receiving said output signal from said closed-loop control apparatus and directing an output signal to said mixture valve control means for positioning said mixture valve relative to said junction and said air inlet manifold.

4,333,440

APPARATUS FOR CONTROLLING RECIRCULATED EXHAUST GAS QUANTITIES IN SELF-IGNITING INTERNAL COMBUSTION ENGINES

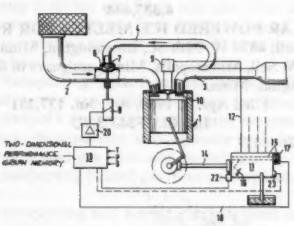
Franz Eheim, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 4, 1980, Ser. No. 127,159

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1979, 2909465

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—569 **2 Claims**



1. An apparatus for controlling recirculated exhaust gas quantities in self-igniting internal combustion engines supplied with fuel from a fuel injection pump comprising:

a quantity adjusting device attached to the fuel injection pump to control fuel quantity;

an air intake manifold connected to an internal combustion engine,

an exhaust gas recirculation line connected from an exhaust manifold of the engine leading and coupled into the air intake manifold;

an rpm transducer connected to a drive shaft of the injection pump;

an exhaust gas quantity control member having an adjusting magnetic valve means and a closing element positioned in the exhaust gas recirculation line;

a travel path transducer connected to detect the position of the quantity adjusting device;

a performance-graph memory means connected to the exhaust gas quantity control member, the rpm transducer and the travel path transducer, and which generates an exhaust gas recirculation quantity control signal to the adjusting magnetic valve means such that the closing element is selectively positioned to open a pre-determined cross-section of the exhaust gas recirculated line according to injection pump drive shaft rpm and quantity adjusting device position.

4,333,441

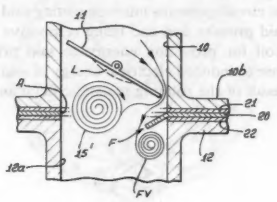
DEVICE FOR IMPROVING THE FUEL-GAS AIR MIXTURE AND THE OPERATION OF AN INTERNAL COMBUSTION ENGINE

Thomas W. Still, 3013 Sanignacio, and William H. Sherlock, 3357 Granada Ave., both of El Monte, Calif. 91731

Filed Mar. 21, 1980, Ser. No. 132,613

Int. Cl.³ F02M *29/00*

U.S. Cl. 123—590 **21 Claims**



1. A device for use with a throttle valve of a conventional carburetor-manifold system of an internal combustion engine,

said device comprising a bore of essentially the same size as the carburetor-manifold bores to convey a fuel-air mixture therethrough to the internal combustion engine,

said bore being constructed and defined with no more than 180 degrees of its bore diameter with means constructed and defined to extend inwardly of the periphery of the bore for intercepting a portion of said mixture from only the descending portion of the throttle valve with a minimum restriction to the flow of said mixture into the manifold and without impeding the opening movement of the carburetor throttle valve,

said means being further characterized as creating a turbulence in the intercepted portion of said mixture immediately below said means.

16. A method of improving the mixing of fuel and air for use in an internal combustion engine having a carburetor, the carburetor having a throttle valve immediately adjacent the outlet bore of the carburetor for controlling the volume of the fuel-air mixture flowing out of the carburetor past the throttle valve and into the internal combustion engine by means of a manifold connected therebetween during the opening of the throttle valve from a closed position to open positions over normal driving speeds of the vehicle equipped with the internal combustion engine creating a normally large rotating vortex immediately below the fuel exit side of the throttle valves, including the steps of

intercepting the flow of the fuel-air mixture by means of a surface immediately after the mixture flows between the adjacent surface of the outlet bore and only the lower edge of the descending portion of the throttle valve of the carburetor, and

shaping the intercepting surface to cause the intercepted fuel-air mixture to create a plurality of relatively small vortices rotating in a plane parallel to and interfering with said large vortex to thereby reduce the back pressure created at the throttle valve whereby an increased volume, and more thoroughly mixed fuel-air mixture flows into the internal combustion engine.

4,333,442

CAPACITOR DISCHARGE IGNITION SYSTEM AND METHOD OF MANUFACTURE THEREOF

Ronald J. Wolf, Zanesville, Ind., assignor to Wabash, Inc., Wabash, Ind.

Continuation-in-part of Ser. No. 105,234, Dec. 19, 1979, abandoned. This application Jul. 24, 1980, Ser. No. 171,705

Int. Cl.³ F02P *1/00*

U.S. Cl. 123—599 **19 Claims**

1. In a capacitor discharge ignition system for use with and positioned adjacent a rotating magnetic field in synchronism

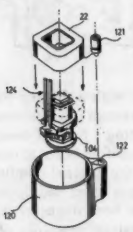
with the operation of an engine, a capacitor discharge ignition sub-assembly for mounting on a ferromagnetic core, the capacitor discharge ignition sub-assembly comprising:

an auxiliary coil;

an ignition transformer including primary and secondary coils;

a coil support member, said auxiliary coil and said primary and secondary coils being concentrically disposed on said coil support member about a common axis;

electrical circuitry means interconnecting said auxiliary coil and said primary coil and being responsive to said auxiliary coil for providing energy to said primary coil in response to induced electrical energy in said auxiliary coil as a result of the rotating magnetic field; and



a housing for receiving and enclosing said auxiliary coil, said ignition coil and said circuitry means, said auxiliary coil being disposed about a first portion of said coil support member, said ignition transformer being disposed about a second portion of said coil support member adjacent said first portion and said electrical circuitry means being disposed about said auxiliary coil and between said auxiliary coil and said housing,

said auxiliary coil being fabricated having a coil height dimension that is a substantial portion of the outer winding diameter dimension of said auxiliary coil, said substantial portion being at least a factor of one-half.

4,333,443

COMPOUND BOW AND BOW CABLING SYSTEM

David Roelle, Pine Bluff, Ark., assignor to Ben Pearson Archery Inc., Pine Bluff, Ark.

Filed Oct. 14, 1980, Ser. No. 196,470

Int. Cl.³ F41B *5/00*

U.S. Cl. 124—24 R **20 Claims**

11. A compound bow adapted for quick disassembly, said bow comprising:

handle means adapted to be manually grasped by an archer;

first and second resilient limb means extending outwardly from said handle means terminating respectively in first and second limb end portions;

first and second eccentric pulley means revolvably coupled to said first and second limb end portions respectively;

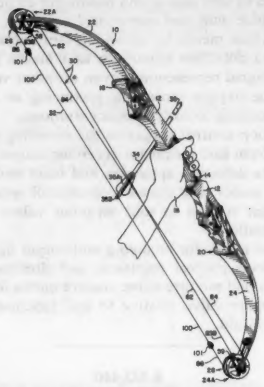
a segmented cable system comprising:

a pair of pulley cables, each pulley cable having a first end revolvably associated with one of said pulley means at one of said limb end portions and a second end secured to said bow;

a bowstring adapted to extend between said first and second limb ends for propelling an arrow; and,

a pair of string cables each having a first end revolvably associated with one of said pulley means at one of said limb end portions and coupled to one of said pulley cable first ends, each string cable including a second end removably coupled to said bowstring; and,

coupling members secured to said pulley cable first ends and to said string cable first ends, said coupling members adapted to be selectively secured together whereby to



connect a pulley cable to a string cable thereby joining said segmented cable system.

4,333,444

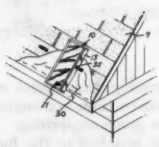
SOLAR POWERED ICE MELTER FOR ROOFS

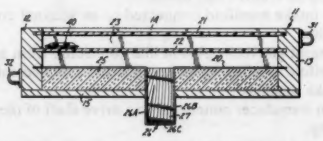
Roger I. Sell, 4824 W. 99th St., Bloomington, Minn. 55437, and Irving W. Sell, Minneapolis, Minn., assignors to Roger I. Sell, Bloomington, Minn.

Filed Apr. 4, 1980, Ser. No. 137,251

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—417 **12 Claims**



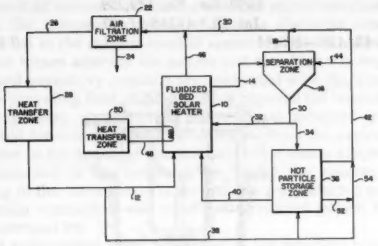


1. A portable solar collector for melting ice and preventing ice formation along a path down a sloping supporting surface on which the collector is mounted comprising a housing with a bottom wall, means on said housing forming a solar energy absorber with a heat absorbent surface for converting solar energy into heat, and an elongated heat conductor having a rib surface smaller in area than the heat absorbent surface extending to the outside of said housing through an opening in the bottom wall and in heat transfer relationship to said absorber, whereby heat from said absorber is transferred to and concentrated in said conductor, and said rib surface conducts heat to material in contact therewith.

4,333,445
FLUIDIZED BED SOLAR ENERGY HEATER

Donald M. Lee, 92 S. Altamont Rd., Huntington, W. Va. 25701

Filed Jan. 24, 1980, Ser. No. 115,241
Int. Cl.[3] F24J *3/02*
U.S. Cl. 126—436 11 Claims



1. In combination, a fluidized bed of dark particles contained within a solar heater, a gas filter, a zone for receiving heat, means for separating said particles from a gas and a storage zone for storing heated particles, including:

means for transmitting and admitting unheated gas to the solar heater under sufficient volume and pressure to maintain the particles within the solar heater in the physical state of a fluidized bed,

said solar heater being an enclosed container covered by a transparent wall facing in the direction of the sun whereby the rays of the sun will pass through said wall and heat the contents of said container,

means for receiving heated gas from said solar heater and transporting it to the gas filter, said gas filter including means to separate said gas from solids entrained therein,

means for transporting gas from said gas filter to the zone for receiving heat,

means for transporting heated gas and particles from said solar heater to a separator, said particles being in the physical state of a transported bed in their movement from the heater to the separator, said separator including means for separating said gas from said particles,

means for transporting heated gas from said separator to said gas filter,

means for transporting said heated particles from said separator to said storage zone,

means for passing unheated gas through the heated particles in the storage zone and subsequently to the gas filter, and

means for transporting cooled particles from said storage zone to the solar heater.

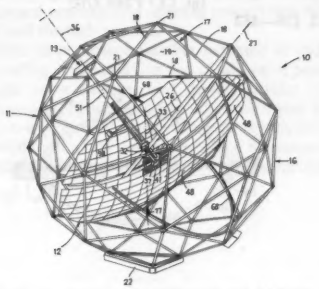
4,333,446
SOLAR CONCENTRATOR

Jerry S. Smyth, Huntington Twp., Huntington County, Ind., assignor to Smyth Aerodynamics, Inc., Huntington, Ind.

Filed May 16, 1980, Ser. No. 150,524
Int. Cl.[3] F24J *3/02*
U.S. Cl. 126—438 10 Claims

1. In a solar concentrator having a stationary support frame, a dish-shaped reflector assembly movably supported on said frame for angular displacement about first and second substantially perpendicular axes, and first and second drive means interconnected to said reflector assembly for effecting angular displacement thereof relative to said frame about the respective first and second axes, comprising the improvement wherein:

said stationary support frame is an open ball-like framework formed as a geodesic dome, a support shaft extending substantially diametrically across the interior of said open framework and having the opposite ends thereof supported on said framework, said support shaft defining said first axis and being oriented to extend substantially parallel with the earth's north-south axis, support means hingedly supported on said support shaft substantially at the midpoint thereof for permitting angular displacement of said support means relative to said support shaft about said



second axis, and said dish-shaped reflector assembly being surrounded by and entirely positioned within the interior of said ball-like framework and fixedly secured to said support means so as to be movable within said open framework.

4,333,447
SOLAR RECEIVER TUBE SUPPORT

Craig M. Lemrow, Big Flats, and Arthur H. Wilder, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

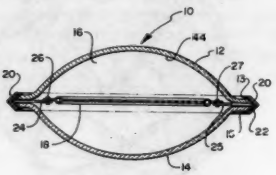
Filed Jun. 4, 1980, Ser. No. 156,761
Int. Cl.[3] F24J *3/02*
U.S. Cl. 126—443 14 Claims

1. In a solar energy collector having a solar window portion and a thermally cyclical solar energy receiver element located therewithin, a support for the receiver element adapted to locate same in spaced relation with respect to the window and to accommodate linear expansion and contraction of the receiver element relative to the window due to thermal cycles thereof, the support comprising; a bearing adapted to engage opposed surfaces of the receiver element and the window including a plurality of roller bearings being selectively located between the opposed surfaces of said window and said receiver for spacing one from the other and being free to rollably carry the receiver element as it expands and contracts during thermal cycles, and a frame member located between said opposed surfaces of said window and said receiver including retainer means for associatively accommodating one each of the roller bearings therein and securing each to a limited path of rotation relative to the window and the receiver element during each thermal cycle.

4,333,448
SOLAR ENERGY ABSORBER APPARATUS AND METHOD

Steven A. Johnson, 136 N. 1st West, Preston, Id. 83263

Division of Ser. No. 711,334, Aug. 3, 1976, Pat. No. 4,185,616. This application Sep. 21, 1979, Ser. No. 77,805
Int. Cl.³ F24J 3/02
U.S. Cl. 126—452 4 Claims



1. A method for absorbing solar energy in the form of heat in a liquid comprising the steps of:

preparing an absorber panel for the absorption of solar energy comprising combining a liquid flow channel with a solar energy absorbing material and forming the combination into a surface;

forming an enclosure for the absorber panel by fabricating an upper panel from transparent material with a curvilinear surface having its periphery in a single plane and joining a lower panel thereto, the lower panel having a curvilinear surface and a periphery in a single plane, the periphery of the lower panel dimensionally corresponding to the periphery of the upper panel;

enclosing the absorber panel in the enclosure;

sealing the periphery of the enclosure;

creating a vacuum condition within the enclosure thereby insulating the absorber panel from convective and conductive heat losses;

compressing the enclosure around its periphery by applying a compressive force parallel to the plane formed by the juncture of the peripheries of the upper and lower panels to compensate for the tension placed on the periphery of the enclosure by the vacuum condition in the enclosure; and

exposing the absorber panel to solar radiation.

4,333,449
WATER RESISTANT ADHESIVE STRIP

Heinz Müller; Peter Jauchen, both of Hamburg; Bodo Szonn, Kisdorf, and Rolf Schulze, Hamburg, all of Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Fed. Rep. of Germany

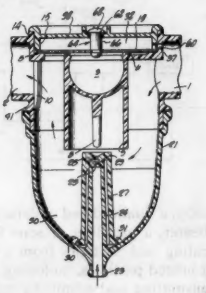
Filed Jun. 11, 1981, Ser. No. 272,596
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1980, 3022605
Int. Cl.³ A61F 13/00
U.S. Cl. 128—155 9 Claims

1. In a water-resistant adhesive strip comprising a support having a back and front, and an adhesive layer on said front, the improvement which comprises said support being a porous, thin fiber web, elastic in at least one direction, and having a pore size of 0.5 to 2.0 mm, a thermosetting, water-impermeable lacquer layer about 5 to about 10 microns thick on said back, said lacquer layer is joined to said web by a porous, elastic intermediate layer, said lacquer layer being less elastic than said support in at least one direction, whereby cracking of said lacquer layer occurs under stretching of said support.

4,333,450
NEBULIZER-MANIFOLD

Victor E. Lester, P.O. Box 608, Sonora, Calif. 95370

Continuation of Ser. No. 750,510, Dec. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 635,902, Nov. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 523,123, Nov. 12, 1974, abandoned. This application Apr. 11, 1980, Ser. No. 139,259
Int. Cl.³ A61M 11/00
U.S. Cl. 128—200.14 7 Claims



2. A nebulizer-manifold device for introducing a spray into a low pressure main gas stream, comprising:

a body member defining a nebulizer bowl and an exhalation control chamber including a cover member having an opening and a vent valve movably disposed in said opening, said body member including a main gas inlet, a patient connector port and an exhalation port;

said main gas inlet and said patient connector port in open communication with said nebulizer bowl and through which gas from the low pressure main gas stream flows, said patient connector port adapted to be in communication with said exhalation port;

a pressure sensitive member comprising a flexible diaphragm member separating said nebulizer bowl and said exhalation control chamber and extending across said exhalation port and adapted to close said exhalation port during an inhalation phase when the gas flows from said main gas inlet through said nebulizer bowl into said patient connector port; and

a passageway communicating low pressure gas from said main gas inlet to said exhalation control chamber to close said exhalation port during the inhalation phase, said vent valve being connected to a flexing portion of said diaphragm member to thereby close said valve during an inhalation phase and to open said valve during an exhalation phase.

4,333,451
POSITIVE PRESSURE BREATHING APPARATUS WITH CONDENSATE REMOVAL

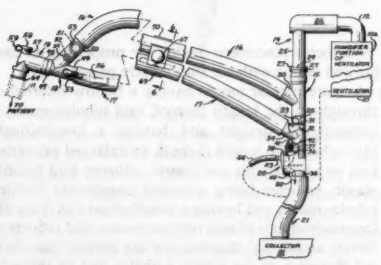
Bernard R. Paluch, 1607 Cedar La., Mt. Prospect, Ill. 60056

Filed Dec. 12, 1980, Ser. No. 215,832
Int. Cl.³ A61M 16/00
U.S. Cl. 128—205.12 18 Claims

2. A condensate removal system for use with a ventilation circuit extending between a patient and a ventilator having means for conditioning the air, wherein said circuit includes a manifold having an interior chamber and including internal wall means dividing the interior chamber of the manifold into an inhalation chamber having a lowermost portion and an exhalation chamber having a lowermost portion with the lowermost portion of the inhalation chamber being positioned above the lowermost portion of the exhalation chamber, said manifold having a lowermost portion communicating with the

lowermost portion of said exhalation chamber and an exhaust conduit connection in that lowermost portion, an air-supply conduit having one end connected to said inhalation chamber and the other end adapted to be connected to the ventilator, a patient inspiratory conduit connected to the manifold and communicating with the inhalation chamber above the lowermost portion thereof, a patient expiratory conduit connected to the manifold and communicating with said exhalation chamber above the lowermost portion thereof, a discharge conduit connected to the exhaust conduit connection of the manifold, conduit means adjacent the patient and to which the inspiratory and expiratory conduits are connected with the conduit means providing fluid communication between the inspiratory and expiratory conduits, and valve means mounted in the manifold for controlling the flow of fluid from the expiratory chamber to the discharge conduit, said valve means adapted to be connected to the ventilator for timing the opening and closing of the valve means in accordance with selected modes of patient ventilation, said condensate removal system being characterized by:

said valve means being positioned in the manifold between the lowermost portion of the exhalation chamber and said



lowermost portion of the manifold to control the flow of fluid therebetween, said manifold having air-supply conduit and inspiratory conduit connections to which said air-supply conduit and inspiratory conduit are connected and communicate with said inhalation chamber and an expiratory conduit connection to which said expiratory conduit is connected and communicates with said exhalation chamber, and said wall means including a lower wall portion defining an orifice forming a fluid communication between the inhalation and exhalation chambers;

whereby liquid accumulating in the exhalation conduit will drain into the exhalation chamber and liquid accumulating in the inhalation chamber will drain through the orifice into the exhalation chamber and thence pass through the valve means, when open, to the exhaust conduit connection, and said orifice presents a substantial resistance to the flow of air between the two chambers as compared to the resistance to the flow of air between the two chambers that exists through the inspiratory and expiratory conduits and their fluid communication at the conduit means to the end that the orifice is virtually closed to the passage of air during normal operation of the ventilation circuit.

4,333,452

PRESSURE CONTROL SYSTEMS

Anthony S. Au, P.O. Box 2593 Station A, Sudbury, Ontario, Canada (P3A 4S9)

Division of Ser. No. 809,802, Jun. 24, 1977, Pat. No. 4,178,938. This application Aug. 7, 1979, Ser. No. 64,378

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—205.24 **1 Claim**

1. In an expiratory system having an expiratory passage, the improvement of: means for generating a positive and expiratory pressure comprising a pneumatic valve comprising:

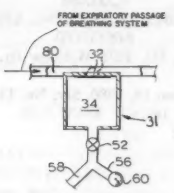
(a) a body,

(b) a through passage opening through said body, said through passage having a longitudinally extending first side wall which is arcuate in shape in a direction transverse to its longitudinal extent,

(c) an enclosed pressure chamber formed in said body and disposed outwardly from said through passage,

(d) a valve passage extending between said pressure chamber and said through passage, said valve passage having a first end disposed opposite and opening toward said first side wall of said through passage,

(e) a flexible valve closure member mounted in said body and extending across said first end of said valve passage to close said valve passage, said flexible closure member being disposed opposite said first side wall of said through passage in a face-to-face relationship therewith and being extendable from a first position in which it is spaced from said first side wall to permit free flow of fluid through said



through passage to a second position in which it extends into engagement with said first side wall to close said through passage in response to variations in the differential pressure between the pressure in said pressure chamber and the pressure in said through passage,

(f) an input passage means opening into said pressure chamber for admitting air under pressure to and venting air from said pressure chamber,

(g) valve means in said single input passage which is operable for selectively opening and closing said input passage whereby said valve is closed it completely isolates said pressure chamber such that after pressurizing said pressure chamber, said valve may be closed and said pneumatic vent valve may operate automatically to open and close said through passage as required in use.

4,333,453

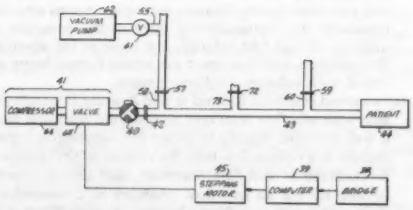
RESPIRATOR VALVE

Jerome A. Rodder, 775 Sunshine Dr., Los Altos, Calif. 94022

Division of Ser. No. 951,167, Oct. 13, 1978, Pat. No. 4,262,689. This application May 13, 1980, Ser. No. 149,486

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—205.24 **5 Claims**



1. A respirator comprising:

a gas compressor;

a tee connection having first, second, and third legs;

a sealless control valve having an inlet to which the compressor is connected and an outlet connected to the first leg of the tee connection, the control valve having a chamber therein communicating with said inlet and outlet

and adjustable means freely mounted in said chamber to provide a minimum flow position and a maximum flow therethrough to change the flow rate between the inlet and outlet, said adjustable means being freely mounted in said chamber such that gas continuously leaks through the valve from inlet to outlet;

a vacuum source;

flow control means connecting the second leg of the tee connection to the vacuum source for continuously drawing gas away from the tee connection such that substantially none of said gas flowing from said valve in its minimum flow setting passes into said third leg thereby compensating for the gas leakage through the valve; and

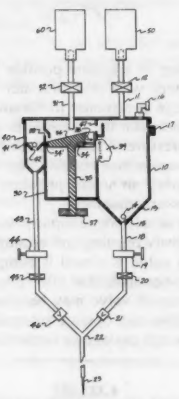
a patient breathing tube connected to the third leg of the tee connection.

4,333,454

AUTOMATIC TUBULAR FEEDING APPARATUS AND METHOD

Thomas S. Hargest, III, 1078 Winslow Dr., Charleston, S.C. 29412

Filed Jan. 14, 1980, Ser. No. 111,609
Int. Cl.³ A61M 5/00
U.S. Cl. 128—214 R **27 Claims**



1. A system for tubular administration of a first medical solution with automatic conversion to administration of a second medical solution when administration of the first medical solution is substantially complete comprising:

(a) a housing;

(b) a first reservoir located in said housing and being adapted to receive a predetermined quantity of said first solution, said reservoir having floating ball valve means associated therewith that automatically open in the presence of a quantity of said first solution and close in the absence of first solution, said first reservoir means further being associated with solution discharge means;

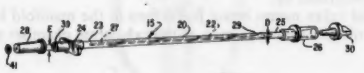
(c) a second reservoir located in said housing in communication with said first reservoir, said second reservoir having a wall movable therein to preset the volumetric capacity thereof at a volume less than the volume of first solution to be received in said first reservoir, said second reservoir further having an overflow chamber in communication therewith, said overflow chamber having floating ball valve means associated therewith, said valve means opening in the presence of a quantity of said second solution and closing in the absence of second solution, said overflow chamber valve means being associated with solution discharge means and said second reservoir being adapted for association with a source of second solution, both said solution discharge means being connectable with a means for feeding said solutions to the body of a patient, said effective volumetric capacity of said second reservoir being such that second solution flowing into said chamber during feeding of first solution from said first reservoir will overflow into said overflow chamber just prior to completion of discharge of said first solution, whereby second solution discharge from said second reservoir automatically initiates without height dependence of said first or second solution.

4,333,455

INJECTABLE CATHETER AND METHOD OF PLACING SAME

Raymond O. Bodicky, St. Louis, Mo., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Dec. 26, 1979, Ser. No. 106,493
Int. Cl.³ A61M 5/00
U.S. Cl. 128—214.4 **8 Claims**



1. A catheter placement device for propelling an elongate flexible and elastic catheter into a body passageway;

an elongate tubular means having a hollow internal cavity throughout the length thereof, said tubular means being substantially straight and having a longitudinal axis throughout the length thereof, an enlarged proximal portion on said flexible and elastic catheter; said flexible and elastic catheter being disposed completely within said tubular means and having a longitudinal axis lying along a longitudinal axis of said tubular means; said tubular means having an internal diameter slightly greater than the external diameter of the elastic catheter and of the enlarged proximal portion of said elastic catheter to support the catheter along its length;

an introducer cannula having one end portion insertable into said body passageway;

means for connecting a distal end of said tubular means with said introducer cannula; and

dispensing means removably connected to a proximal end of said tubular means for selectively expelling fluid into said tubular means for propelling said flexible and elastic catheter along the axis of said tubular means and out of the distal end of said tubular means and partially through said introducer cannula and partially into said body passageway.

4,333,456

SELF-ASPIRATING HYPODERMIC SYRINGE AND SELF-ASPIRATING ASSEMBLY THEREFOR

William G. Webb, Rensselaer, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

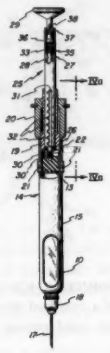
Filed Feb. 9, 1981, Ser. No. 232,630
Int. Cl.³ A61M 5/22
U.S. Cl. 128—218 R **40 Claims**

1. A self-aspirating hypodermic syringe of the type used in combination with a cartridge ampoule which is sealed at its upper end by a slidable piston and at its lower end by a pierceable membrane and which contains an injectable fluid therein, the syringe having a double ended needle attached thereto for communication with the cartridge ampoule contents via the pierceable membrane, said syringe comprising in combination:

(A) a syringe holder comprising a head, a barrel attached thereto for receiving said cartridge ampoule and provided at its lower end with a double ended needle, and a generally cylindrical holding means within said head which is adapted to securely hold said cartridge ampoule within said barrel; and

(B) a self-aspirating assembly slidable within the bore of said

holding means comprising a pair of plungers, one slidable within the other, said plungers being biased one against the other, the inner plunger being adapted for positive interengagement with said slidable piston of said cartridge ampoule and the outer plunger being adapted for positive, selective and reversible locking with said holding means thereby to immobilize said outer plunger against axial movement relative to said syringe holder and cartridge ampoule,



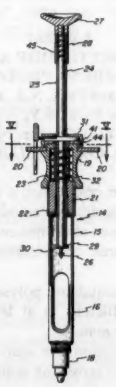
whereby upon alternate exertion of downward pressure upon said inner plunger while said outer plunger is locked and release of said downward pressure, the said bias of said inner plunger against said outer plunger creates aspirating conditions within said cartridge ampoule and whereby upon exertion of downward pressure upon said inner plunger while said outer plunger is unlocked, said inner and outer plungers are freely slidable within the bore of said holding means.

4,333,457

SELF-ASPIRATING SYRINGE WITH FRICTIONALLY ENGAGED LOCKING COLLET

Herman Margulies, South Orange, N.J., assignor to Sterling Drug Inc., New York, N.Y.

Filed Feb. 9, 1981, Ser. No. 232,633
Int. Cl.³ A61M 5/22
U.S. Cl. 128—218 R **10 Claims**



1. A self-aspirating hypodermic syringe of the type used in combination with a cartridge ampoule which is sealed at its upper end by a slidable piston and at its lower end by a pierceable membrane, and which contains an injectable fluid therein, which comprises a syringe holder having:

(A) a head;

(B) a barrel attached thereto for receiving said cartridge ampoule and provided at its lower end with a double ended needle for communication with the cartridge ampoule contents; and

(C) a generally cylindrical holding means within said head, said holding means being adapted:

(1) to securely hold said cartridge ampoule within said barrel;

(2) to receive within the bore thereof a double plunger mechanism comprising an inner plunger slidable within the bore of, and biased against, an outer plunger, said inner plunger having interengagement means for making positive interengagement with the slidable piston closing the upper end of said cartridge ampoule; and

(3) to generate frictional resistance to axial movement of said outer plunger,

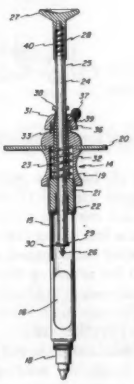
whereby upon alternate exertion of downward pressure upon said inner plunger and release thereof when said frictional resistance is generated, the bias of said inner plunger against said outer plunger creates aspirating conditions in said ampoule.

4,333,458

SELF-ASPIRATING SYRINGE WITH POSITIVELY ENGAGED LOCKING COLLET

Herman Margulies, South Orange, N.J., and William G. Webb, East Greenbush, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Feb. 9, 1981, Ser. No. 232,634
Int. Cl.³ A61M 5/22
U.S. Cl. 128—218 R **7 Claims**



1. A self-aspirating hypodermic syringe of the type used in combination with a cartridge ampoule which is sealed at its upper end by a slidable piston and at its lower end by a pierceable membrane, and which contains an injectable fluid therein, which comprises a syringe holder having:

(A) a head;

(B) a barrel attached thereto for receiving said cartridge ampoule and provided at its lower end with a double ended needle for communication with the cartridge ampoule contents; and

(C) a generally cylindrical holding means within said head, said holding means being adapted for:

(1) securely holding said cartridge ampoule within said barrel;

(2) receiving within the bore thereof a double plunger mechanism comprising an inner plunger slidable within the bore of, and biased against, an outer plunger, said inner plunger having interengagement means for making positive inter-

engagement with the slidable piston closing the upper end of said cartridge ampoule; and

(3) positively, selectively and reversibly locking said outer plunger within the head of said syringe holder thereby to immobilize said outer plunger against axial movement relative to said syringe holder, whereby upon alternate exertion of downward pressure upon said inner plunger and release thereof when said holding means is in locking engagement, the bias of said inner plunger against said outer plunger creates aspirating conditions within said ampoule and whereby upon exertion of downward pressure upon said inner plunger when said holding means is unlocked, said inner and outer plungers are freely slidable within the bore of said holding means.

4,333,459

INTRAMUSCULAR INJECTION DEVICE SUITABLE FOR INSULIN INJECTIONS

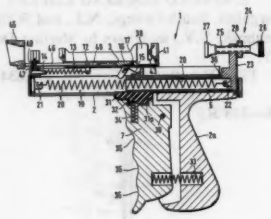
Michael Becker, Brucknerstrasse 6, D-5020 Frechen-Grefrath, Fed. Rep. of Germany

Filed Mar. 4, 1981, Ser. No. 240,259

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1980, 8006721[U]

Int. Cl.³ A61M *5/20*

U.S. Cl. 128—218 F **11 Claims**



1. An injection device for intramuscular injection of a medicament comprising:

a guiding housing (2) having a pistol grip (2*a*) depending therefrom, a trigger member (7) forwardly adjacent said pistol grip (2*a*) and movable with respect thereto and to said housing, and a first spring (33) opposing the pulling of said trigger member back against said pistol grip;

a push member (5) for actuating the injection device movable in a first guideway (19) of said housing connected to a second spring for moving it forwardly in said guideway and having a heel bracket (23);

a carriage (3) movable in said second guideway in said housing and having means for holding a syringe (4) in said carriage with its needle extending forward and its piston shaft extending rearward towards said heel bracket (3);

a third spring (13) connected to said carriage for moving said carriage forward for making a skin puncture with the needle of a syringe mounted therein, and

a releasable catch (16,15) cooperating with a notch in said carriage (3) and mounted on said housing, for holding said carriage in cocked position against the force of said third spring, said catch having a portion extending into the initial path of travel of said push member (5) for causing said push member to release said carriage from its cocked position;

said trigger member (7) having means (31) for frictionally engaging said push member (5) for braking the movement of said push member and for arresting the movement thereof by the force of said first spring (33) in the idle or released condition of said trigger member (7)

said heel bracket (23) having means for bearing against and actuating the piston shaft of a syringe mounted in said carriage.

4,333,460

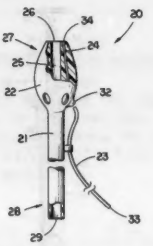
ENEMA APPARATA IMPROVEMENTS RELATING DOUBLE CONTRAST STUDIES

Roscoe E. Miller, 7400 W. 88th St., Indianapolis, Ind. 46278

Continuation-in-part of Ser. No. 39,502, May 16, 1979, abandoned. This application Apr. 4, 1980, Ser. No. 131,965

Int. Cl.³ A61M *3/00*

U.S. Cl. 128—239 **5 Claims**



1. An enema administering apparatus insertable into the rectum for delivery of a contrast medium to internal portions of a patient's anatomy, said enema administering apparatus comprising:

a generally tubular stem portion having a free end, an insertable end and a single passageway extending therethrough from an inject location adjacent said free end to a discharge location adjacent said insertable end;

an enlarged hollow tip portion disposed at said insertable end of said tubular stem portion and having at least one contrast medium exit aperture located therein and defining a contrast medium passageway arranged in flow communication between said single passageway and said exit aperture; and

air passageway means completely external of said single passageway and said contrast medium passageway and having an air delivery outlet opening disposed in said tip portion and which is spaced apart from said contrast medium exit aperture.

4,333,461

BORATED POLYSACCHARIDE ABSORBENTS AND ABSORBENT PRODUCTS

Ernest G. Muller, Highland Park, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 17, 1979, Ser. No. 104,204

Int. Cl.³ A41B *13/02*

U.S. Cl. 128—284 **2 Claims**

1. A disposable diaper comprising a body contacting, urine permeable topsheet, a liquid impervious bottom sheet, and an intermediate layer between said topsheet and said bottom sheet comprising the dry borax cross-linked guar gum absorbent perpared by:

mixing a cis1,2-diol containing polysaccharide material and water for time sufficient to at least substantially completely hydrate the material;

adding an aqueous solution of a source of borate ions to the hydrated material to cross-link same and form a thickened gell mass; and,

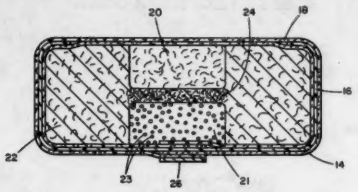
dehydrating the thickened mass to drive off water contained therein; said absorbent carried by a flexible substrate open cell plastic foam whereby said article is capable of being held in form retaining contact with an animal body such that the absorbent material is capable of coming in contact with body fluids exuded by the body.

4,333,462

ABSORBENT STRUCTURE CONTAINING SUPERABSORBENT

Dennis C. Holtman, Orland Park, and Shirley A. Wade, Chicago, both of Ill., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Filed Nov. 17, 1980, Ser. No. 207,522
Int. Cl.[3] A41B *13/02*
U.S. Cl. 128—287 12 Claims



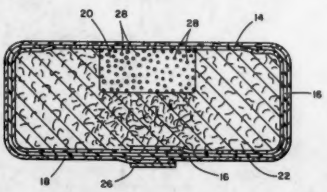
1. An absorbent structure, suitable for absorption of body fluids, comprising a moisture-impermeable backing sheet; an absorbent, loosely-compacted cellulosic fibrous batt, superimposed on said backing sheet; and a moisture-permeable fabric cover, covering at least the side of said absorbent batt opposite said backing sheet, said absorbent batt being provided with two reservoirs, each having a capacity sufficient to hold at least 75% of the body fluid discharged in one second, the first reservoir being situated immediately below the moisture-permeable fabric cover in the void zone and being formed by compression of the cellulosic fibrous batt, the second reservoir being of substantially the same size as the first reservoir and being located below the first reservoir within the cellulosic fibrous batt, the second reservoir being formed by compression of the cellulosic fibers in the reservoir zone, said second reservoir containing deposited therein a water-swellable, water-insoluble absorbent composition.

4,333,463

ABSORBENT STRUCTURE CONTAINING SUPERABSORBENT

Dennis C. Holtman, Orland Park, Ill., assignor to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Filed Nov. 17, 1980, Ser. No. 207,523
Int. Cl.[3] A41B *13/02*
U.S. Cl. 128—287 11 Claims



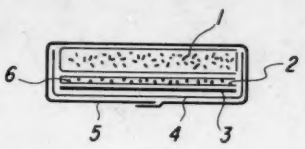
1. An absorbent structure suitable for absorption of body fluids comprising a moisture-impermeable backing sheet; an absorbent, loosely-compacted cellulosic fibrous batt, superimposed on said backing sheet; and a moisture-permeable fabric cover, covering at least the side of said absorbent batt opposite said backing sheet, said absorbent batt being provided with a reservoir having a capacity sufficient to hold at least 75% of the body fluid discharged in one second and containing deposited therein a water-swellable, water-insoluble absorbent composition, said reservoir being situated in the void zone and being formed by the compression of the cellulosic fibrous batt.

4,333,464

SANITARY NAPKIN

Tadao Nakano, Kainan, Japan, assignor to Zenmi Co., Ltd., Wakayama, Japan

Filed Apr. 11, 1980, Ser. No. 139,266
Claims priority, application Japan, Apr. 28, 1979, 54-53078
Int. Cl.[3] A61F *13/16*
U.S. Cl. 128—290 R 3 Claims



1. A sanitary napkin comprising at least one layer formulated of a water-absorbable substance and at least one layer consisting of a film based on water-soluble or water-dispersible polyvinyl alcohol,

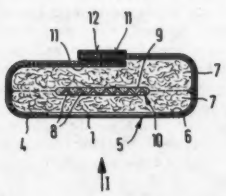
said water-absorbable substance comprising a powder of a water-soluble of water-dispersible polymeric substance and a powder of a gelatinizing accelerator for polyvinyl alcohol selected from the group consisting of boric acid, sodium borate, sodium surface, magnesium sulfate and aluminum sulfate.

4,333,465

HYGIENIC SANITARY TOWEL

Georg Wiegner, Breslauer Strasse 35, 4060 Viersen 11, Fed. Rep. of Germany

Filed Dec. 5, 1979, Ser. No. 100,556
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1978, 2853243
Int. Cl.[3] A61F *13/16*
U.S. Cl. 128—290 R 2 Claims

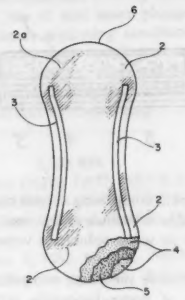


1. Hygienic sanitary towel for absorbing body fluid from a fluid opening of the body, consisting of an absorptive filling of hydrophilic fiber material with at least one cover, characterized by the fact that the outer cover (5) consists of a liquid-impermeable composite material and has a defined liquid-permeable absorptive zone (1) at the side facing the fluid opening and contains in the core of the filling an insert (8) in which there are highly absorptive polymers and consists on the outside of a liquid-permeable carrier material (4) of woven material, fleece or tissue and, on the inside, with the exception of the defined absorption zone (1), of a liquid-impermeable layer (6) and wherein insert (10) in the core consists of tissue paper, 8 which is folded once or several times and on which the highly absorptive polymers are applied before the paper is folded.

4,333,466
SANITARY NAPKIN WITH IMPROVED PANTY ADHESIVE

Billie J. Matthews, Menasha, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 5, 1980, Ser. No. 175,298
Int. Cl.[3] A61F *13/16*
U.S. Cl. 128—290 R 5 Claims



1. A sanitary napkin comprising an absorbent layer and a fluid impervious baffle, attached thereto said napkin having inwardly arcuate edges along the sides of said baffle and a plurality of pressure sensitive adhesive strips corresponding to each of these edges, said adhesive strips each being spaced equidistantly from the longitudinal edges in the arcuate portion of the napkin.

4,333,467
NONSTICK CONDUCTIVE COATING

Joseph J. Domicone, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 12, 1979, Ser. No. 102,887
Int. Cl.[3] A61B *17/36*
U.S. Cl. 128—303.14 1 Claim

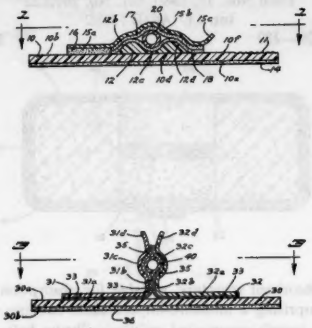
1. In an electrosurgical cutting blade for carrying electrical source generated hemostatic and cauterizing currents to a portion of the blade for contacting with tissue, an electrically conductive non-stick electrode deposited near the cutting edge thereof comprising: a first coating of electrically conductive material adherently deposited on said blade, said conductive material having an exposed working surface and interstices therein producing irregularities in said working surface; a superposed coating of nonstick material adherently deposited and chemically bonded to said first coating in at least said interstices, to the extent that, the working surface of said first coating is sufficiently conductive through the chemical bonded first coating to carry the hemostatic and cauterizing currents to the tissue and the second coating imparts non-stick characteristics to the blade.

4,333,468
MESENTERY TUBE HOLDER APPARATUS

Robert W. Geist, 7 Sandpiper La., St. Paul, Minn. 55110

Filed Aug. 18, 1980, Ser. No. 178,912
Int. Cl.[3] A61M *25/02*
U.S. Cl. 128—348 14 Claims

1. Apparatus for affixing a medical tube or the like to a body comprising a base plate contourable to the shape of a part of the body and in a flat condition having an upper surface and a lower surface, said upper surface including a first end portion, an intermediate surface portion, and an opposite end surface portion, the base plate intermediate portion having an upwardly opening transverse groove, the thickness of the base plate longitudinally on either side of the groove being substantially greater than the thickness of either of the base plate end portions, a layer of pressure sensitive adhesive covering the lower surface for adhering the base plate to the body, and means for affixing a tube to the base plate, said means including an elongated first flap having a first end portion, an intermediate portion and an opposite end portion, a layer of permanent

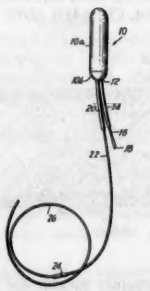


adhesive for bonding the flap first end portion to the base plate first end portion and pressure sensitive adhesive for adhering the flap intermediate portion to the tube and to the base plate intermediate portion longitudinally on either side of the groove that is of a substantially greater thickness than the base plate end portions.

4,333,469
BONE GROWTH STIMULATOR

Keith W. Jeffcoat, Beacon Hill, and Geoffrey G. Wickham, Longueville, both of Australia, assignors to Telectronics Pty. Ltd., New South Wales, Australia

Filed Jul. 20, 1979, Ser. No. 59,443
Int. Cl.[3] A61N *1/18*
U.S. Cl. 128—419 F 83 Claims

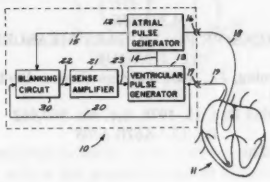


1. An implantable bone growth stimulator comprising a case made of at least 90% titanium, a current source in said case, and anode and at least one cathode leads electrically connected to said current source and exiting said case; characterized by said case having a cylindrical cross-section and a length which is at least two times greater than its diameter, said anode lead being made of platinum, being bent back where it exits said case, and being electrically connected to said case.

4,333,470
OUTPUT PULSE ARTIFACT REJECTION IN DEMAND PACEMAKERS

Thomas C. Barthel, Becker, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 7, 1980, Ser. No. 137,578
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 PG 8 Claims



1. A heart pacemaker comprising:

terminal means for connection to a patient's means for delivery atrial and ventricular stimulation thereto;

generating means for delivering sequential atrial and ventricular electrical stimulation pulses to said terminal means at a predetermined repetition rate;

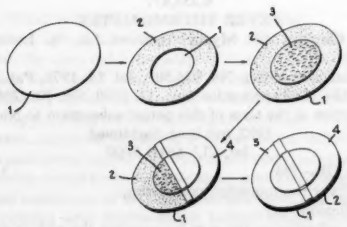
a sensing amplifier for sensing electrical signals indicative of the patient's heartbeat;

blanking means for normally connecting said terminal means to said sensing amplifier for conveying the patient's heartbeat signals thereto, and for selectively decoupling said sensing amplifier from said terminal means during delivery of an atrial stimulation pulse, said blanking means including holding circuit means operative during a blanking interval to hold a prior signal level at the input to the sensing amplifier, and timing means for sequentially returning the blanking means and the holding means to normal operation at the end of the atrial stimulation pulse.

4,333,471
NIPPLE COVER

Tadanobu Nakai, Kita-Katsuragi, Japan, assignor to Tokiwa Chemical Industries, Limited, Osaka, Japan

Filed Jan. 19, 1981, Ser. No. 226,446
Int. Cl.³ A61J 13/00; A41C 3/06
U.S. Cl. 128—505 4 Claims



1. A nipple-cover in the form of a sheet of paper for covering women's nipples comprising a flexible paper backing having an excellent air permeability, a coating layer of tacky and pressure sensitive adhesive composition united to one surface of said paper backing, a felt fabric member centrally disposed on said one surface, a pair of protective cover release papers for covering said felt fabric arranged to lie one above the other at adjacent edge portions thereof with one edge of an inner release paper being turned up and folded.

4,333,472
COMPENSATORY-CORRECTIVE ORTHOPEDIC FOOT DEVICES

Steven E. Tager, 20445 Pacifica Dr., Cupertino, Calif. 95014

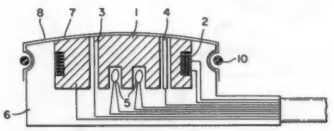
Filed Dec. 31, 1979, Ser. No. 108,799
Int. Cl.³ A61F 5/14
U.S. Cl. 128—581 12 Claims

1. An orthopedic compensatory-corrective device disposed in a subject's footwear to correct varus and valgus recessed structural abnormalities of the foot comprising a compensatory separate moveable cushion pad of a material wedge-shaped laterally of the foot exhibiting a hardness in the range of 15 to 22 durometer to be held between the subject's foot and footwear at the location of the recessed abnormality.

4,333,473
APPARATUS FOR THE CUTANEOUS DETERMINATION OF THE OXYGEN PARTIAL PRESSURE IN BLOOD

Patrick Eberhard, Allschwil, and Wolfgang Mindt, Münchenstein, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sep. 5, 1979, Ser. No. 72,367
Claims priority, application Switzerland, Sep. 11, 1978, 9488/78
Int. Cl.³ A61B 5/00
U.S. Cl. 128—635 2 Claims



1. An apparatus for the cutaneous determination of the partial pressure of gases in blood comprising an anode having a contact surface for application to an individual's skin; a first cathode being a blood gas electrode having a first contact surface for application to an individual's skin and having a gas consumption sufficiently low to enable representative partial pressure measurements; a second cathode being a second blood gas electrode having a second contact surface and consuming practically all gas arriving at its contact surface, the two cathode electrodes being in structural unity with the anode to form a common contact surface; a membrane covering said common contact surface for the application to an individual's skin, and a heating means for heating the common contact surface for thermal stimulation of the blood perfusion.

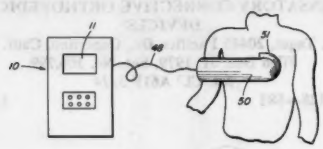
4,333,474
ULTRASONIC IMAGING SYSTEM

Anant K. Nigam, Plantation, Fla., assignor to New York Institute of Technology, Old Westbury, N.Y.

Continuation of Ser. No. 875,442, Feb. 6, 1978, Pat. No. 4,207,901, which is a division of Ser. No. 665,898, Mar. 11, 1976, Pat. No. 4,084,582. This application Jun. 9, 1980, Ser. No. 157,398

Int. Cl.³ A61B 5/00

U.S. Cl. 128—660 **7 Claims**



1. In an ultrasonic apparatus for imaging sections of a body by transmitting ultrasonic energy into the body and determining the characteristics of the ultrasonic energy echoing therefrom, said apparatus including timing means for generating timing signals; energizing/receiving means operative in response to the timing signals; and display/record means synchronized with said timing signals for displaying and/or recording image-representative signals from the energizing-/receiving means; a scanning module, comprising:

a fluid-tight enclosure having a scanning window;

a fluid contained in said enclosure;

a reflective scanner disposed in said fluid;

a first transducer, mounted in conjunction with said reflective scanner, for converting energy from said energizing-/receiving means to ultrasonic energy;

a second transducer spaced from said scanning window and said reflective scanner for converting ultrasonic echoes reflected from said reflective scanner to electrical signals, said electrical signals being coupled to said energizing-/receiving means; and

driving means synchronized with said timing signals for moving said reflective scanner in periodic fashion.

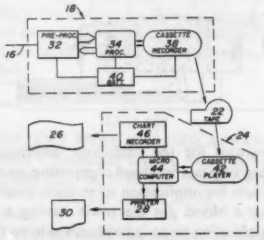
4,333,475
AMBULATORY CARDIAC MONITORING SYSTEM

John R. Moreno, Cherry Hill, N.J.; Richard J. Byrne, and Charles B. Shakespeare, both of Philadelphia, Pa., assignors to Medical Concepts, Inc., Mount Laurel, N.J.

Filed Dec. 6, 1979, Ser. No. 100,903

Int. Cl.³ A61B 5/04

U.S. Cl. 128—711 **48 Claims**



1. An ambulatory cardiac monitoring system to event record and monitor ECG signals from a patient for a predetermined time interval on a recording medium, said recording medium being removed from said patient subsequent to said predetermined time interval for insert into scanner means for producing printed outputs of said events recorded on said recording medium wherein the improvement comprises:

recorder means to be coupled to said patient during said predetermined time interval, said recorder means being electrically coupled to said patient for (1) continuously monitoring said ECG signals of said patient during said predetermined time interval, and (2) entering a record signal on said recording medium responsive to prior ECG signals monitored from said patient during said predetermined time interval, said recorder means including analog pre-processor means having means for detecting a QRS signal wave complex of said monitored ECG signal for (1) normalization, (2) filtering, and (3) gain control of said monitored ECG signals to produce a plurality of analog pre-processor output signals.

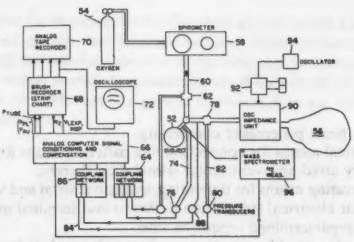
4,333,476
COMPREHENSIVE PULMONARY MEASUREMENT TECHNIQUE

Willis G. Downing, Jr., 9430 Tujunga Canyon Blvd., Tujunga, Calif. 91042

Filed Dec. 15, 1978, Ser. No. 969,962

Int. Cl.³ A61B 5/08

U.S. Cl. 128—720 **17 Claims**



1. An apparatus for the comprehensive measurement of pulmonary functions comprising:

a source of gas which includes no nitrogen;

a closed pulmonary measurement system including an input spirometer coupled to said source of gas for supplying a measured quantity of said gas excluding nitrogen from said source to a subject;

means for collecting gas exhaled by the subject;

means for supplying alternating pressure signals to the mouth of a subject;

means for measuring the flow of air exhaled by the subject;

means for continuously measuring the nitrogen content of the exhaled air;

means for determining the resistance of the lungs to both steady state and alternating air flow during various portions of a breathing cycle; and

means for recording and correlating all of said measured and determined values.

4,333,477
FEVER THERMOMETER

Melvin Chervitz, 121 Mystic Meadows La., St. Louis, Mo. 63141

Continuation of Ser. No. 924,507, Jul. 14, 1978, Pat. No. 4,232,684. This application Nov. 12, 1980, Ser. No. 206,054 The portion of the term of this patent subsequent to Nov. 11, 1997, has been disclaimed.

Int. Cl.³ A61B 5/00

U.S. Cl. 128—736 **1 Claim**

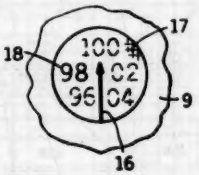
1. A fever thermometer, comprising:

(a) a flexible web,

(b) an adhesive on the web for securing the web to the skin of the human body.

(c) a plurality of numerical display areas on the web having a predetermined attitude so as to be read easily when the

web is adhered in a predetermined directional attitude, each numerical display area including an encapsulated liquid crystal indicator, the color spectrum of each liquid crystal indicator being responsive to a different specific temperature range, and the liquid crystal indicators being of a color to be substantially invisible at temperatures not within the responsive temperature ranges of the liquid crystal indicators, and



(d) a directional indicator on the web for enabling adherence of the web in the predetermined directional attitude with the numerical display areas in their predetermined attitude when the numerical display areas are substantially invisible at temperatures not within the responsive temperature ranges of the liquid crystal indicators so that the numerical display areas can be easily read when made visible at temperatures within the responsive temperature ranges of the liquid crystal indicators.

4,333,478

BLOOD EXTRACTION INSTRUMENT

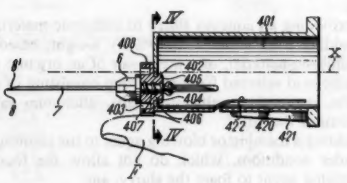
Karl Krieg, Nuertingen, Fed. Rep. of Germany, assignor to C.A. Greiner & Sohne GmbH & Co. KG, Nuertigen, Fed. Rep. of Germany

Filed Oct. 14, 1980, Ser. No. 196,721

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1979, 2946680

Int. Cl.³ A61B 5/14

U.S. Cl. 128—764 **10 Claims**



1. A blood extraction instrument, comprising:

a hollow, cylindrical body having an open end and a closed end, the open end being adapted to receive a blood sample tube, said blood sample tube being closed with a membrane by means of a screw-on cap, said screw-on cap being provided with an opening for exposure of said membrane, means for mounting a double-ended hollow needle in said closed end of said cylindrical body, one end of said double-ended hollow needle being positioned to penetrate said membrane of said blood sample tube, said means for mounting said double-ended hollow needle including a connector mounted in said closed end wherein it may be rotatably adjusted with respect to the cylindrical body to enable rotatable adjustment of said needle.

4,333,479

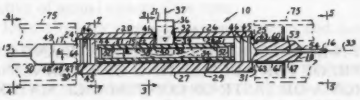
DISPOSABLE NEEDLE ASSEMBLY

Lewis D. Shiplee, III, 1112 S. Magnolia Dr., Apt. V-204, Tallahassee, Fla. 32301

Filed Oct. 1, 1979, Ser. No. 80,484

Int. Cl.³ A61B 5/14

U.S. Cl. 128—766 **7 Claims**



1. In a disposable blood drawing device comprising an evacuated container having a stopper, a holder for the container, and a dual needle assembly that is connectable with the holder for receiving and delivering blood to an evacuated container held thereby, the improved dual needle assembly comprising a housing having opposite end openings, a hypodermic needle mounted in one of said end openings for penetrating and receiving blood from a blood vein, a tap needle mounted in the other of said end openings for penetrating the stopper and delivering the received blood to a container held by the holder, a resilient tube located in the interior of the housing and having a passage that interconnects and communicates with the hypodermic and tap needles for conveying the received blood to the tap needle, and a substantially linearly movable push button that is mounted in the housing and manipulatable at the exterior thereof to constrict said passage and thereby limit the flow of blood therethrough.

4,333,480

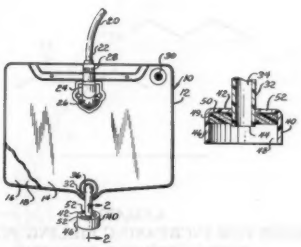
URINE RECEPTACLE WITH A TUBULAR SECTION TO RETAIN AN ANTIMICROBIAL AGENT

Frank K. Villari, Oak Park, and James P. Cianci, Cary, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Apr. 11, 1980, Ser. No. 139,301

Int. Cl.³ A61F 5/44

U.S. Cl. 128—767 **3 Claims**



1. A urine receptacle, comprising:

a container having a chamber for collection of urine;

a tubular section having an inner end attached to a lower portion of the container forming a sampling port means and communicating with said chamber, and an outer end;

port means comprising a hood having an inner wall attached to the tubular section, and a generally annular sidewall extending from said inner wall, with said inner wall and sidewall defining a cavity, with said tubular section extending through the inner wall into said cavity, with said outer end being located in said cavity and being spaced inwardly from an outer edge of the sidewall, and with said outer end and sidewall defining a generally annular groove in said cavity, with the outer edge of said hood sidewall remaining free during use of the receptacle,

means to alleviate heat build up comprising said inner wall having at least one opening extending therethrough; and means in said groove for retaining an antimicrobial agent comprising a ring of porous material in said groove, with said opening communicating directly with said ring.

4,333,481

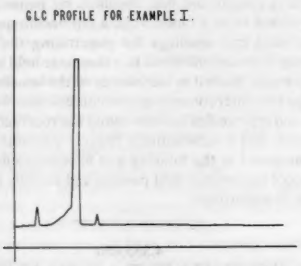
1-N-BUTOXY-1-ETHANOL ACETATE AND USES THEREOF FOR AUGMENTING OR ENHANCING THE AROMA OR TASTE OF CONSUMABLE MATERIALS

Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

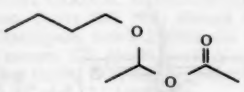
Division of Ser. No. 217,810, Dec. 18, 1980, Pat. No. 4,296,138, which is a continuation-in-part of Ser. No. 176,111, Aug. 7, 1980, Pat. No. 4,296,137. This application Jul. 29, 1981, Ser. No. 287,896

Int. Cl.³ A24B *3/12, 15/30*

U.S. Cl. 131—276 **3 Claims**



1. A process for augmenting or enhancing the aroma or taste of a smoking tobacco comprising the step of adding to smoking tobacco an organoleptic property-modifying, augmenting or enhancing quantity of 1-n-butoxy-1-ethanol acetate having the structure:



4,333,482

PROCESS FOR INCREASING FILLING POWER OF RECONSTITUTED TOBACCO

Joseph L. Banyasz, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Jul. 22, 1980, Ser. No. 171,173

Int. Cl.³ A24B *3/14, 3/18*

U.S. Cl. 131—300 **18 Claims**

1. A method of increasing the filling power of reconstituted tobacco made by a paper-making process which comprises:

(a) uniformly adjusting the moisture content of the reconstituted tobacco to between 15% and 50% by weight;

(b) subjecting the moisturized reconstituted tobacco to heat treatment for a period of time in excess of that required to accomplish evaporation of substantially all of the moisture in the reconstituted tobacco to stiffen the reconstituted tobacco, thereby increasing its filling power at a substantially constant specific volume.

4,333,483

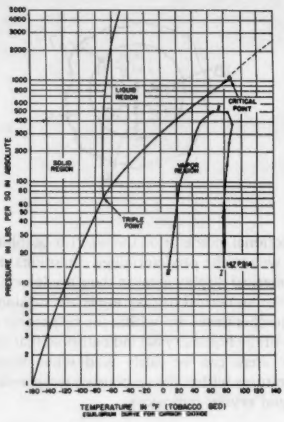
TOBACCO PRODUCT

Roger Z. de la Burde, Powhatan; Patrick E. Aument, Hopewell, and Francis V. Utsch, Chester, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Division of Ser. No. 891,468, Mar. 29, 1978, Pat. No. 4,258,729. This application Apr. 24, 1980, Ser. No. 143,311

Int. Cl.³ A24B *15/10, 15/28*

U.S. Cl. 131—352 **1 Claim**



1. A tobacco product comprising 100 parts by weight of tobacco and at least 1 part by weight of gaseous carbon dioxide, wherein the gaseous carbon dioxide is retained by the tobacco with no other additive not natural to tobacco.

4,333,484

MODIFIED CELLULOSIC SMOKING MATERIAL AND METHOD FOR ITS PREPARATION

Gus D. Keritsis, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 2, 1978, Ser. No. 930,328

Int. Cl.³ A24B *3/14;* A24D *1/18*

U.S. Cl. 131—359 **29 Claims**

1. A process for producing a foamed smoking material comprising:

(a) providing an aqueous slurry of cellulosic material;

(b) adding from about 5 to 40% by weight, based on the cellulosic material, of a metal salt of an organic or inorganic acid selected from the group consisting of calcium salts, magnesium salts, iron salts, aluminum salts, and mixtures thereof;

(c) adding a foaming or blowing agent to the resulting slurry under conditions, which do not allow the foaming or blowing agent to foam the slurry; and

(d) casting or extruding the slurry and then drying the cast or extruded slurry under such conditions wherein the slurry is foamed during the casting or extruding step or during the drying step.

4,333,485

WATER-BASED CLEANING SYSTEM

Tom O. B. Karlsson, Floda, and Hans M. Larsson, Göteborg, both of Sweden, assignors to Nordnero AB, Kungalv, Sweden

Filed Jul. 1, 1980, Ser. No. 165,025

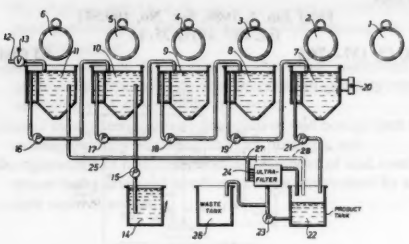
Claims priority, application Sweden, Jul. 3, 1979, 7905806

Int. Cl.³ B08B *3/12*

U.S. Cl. 134—60 **3 Claims**

1. A water-based cleaning system comprising a plurality of treatment stations for use during a cleaning procedure, means

for transporting articles to be cleaned past said plurality of treatment stations, with movement of said articles being in a first direction, means for causing a cleaning liquid to flow through said stations in a second direction which is opposite to said first direction, means for removing said cleaning liquid from the first treatment station and supplying it to the input side of an ultrafilter means, and means for controlling the



amount of said cleaning liquid flowing from the output side of said ultrafilter means, means for dividing said cleaning liquid and for supplying at least a controlled part of said cleaning liquid to one of the last treatment stations and for resupplying at least some of the remainder of said amount of said cleaning liquid to the input side of the ultrafilter means, said control means automatically controlling the flow of said cleaning liquid in said second direction through said treatment stations.

4,333,486

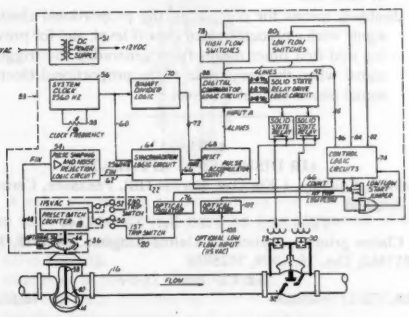
ELECTRONIC VALVE CONTROLLER

Frederick A. Ciccozzi, Erie, Pa., assignor to Geosource Inc., Houston, Tex.

Filed Sep. 5, 1980, Ser. No. 184,347

Int. Cl.³ G05D 7/00

U.S. Cl. 137—1 **22 Claims**



1. A circuit for electronic control of a meter valve system comprising:

an optical switch assembly for monitoring flow through the system, said optical switch assembly generating digital pulses in response to flow rate of a fluid within said system;

a power supply for supplying DC power to said circuit;

pulse shaping and noise rejection circuitry, electrically connected to said optical switch assembly for converting said digital pulses to high level noise free digital pulses;

a system clock generating clock pulses for synchronizing said circuit operation, having a means for adjusting frequency;

synchronization circuitry, electrically connected to said system clock and said pulse shaping and noise rejection circuitry, for sampling and holding said digital pulses such that the falling edge of said digital pulses are coincident with said system clock pulses;

means electrically connected to said system clock for generating a time base;

pulse accumulator circuitry electrically connected to said synchronization circuitry for counting and storing digital pulses over said time base whereby said digital pulses are indicative of actual system flow rate;

control logic circuitry electrically connected to said meter valve system and said synchronization circuitry for generating flow rate signals, based upon data from said meter valve system and generating multilevel shutdown signals based upon a predetermined count of said digital pulses;

means for storing logic data representing a desired flow rate, said means enabled by said flow rate signals from said control logic circuitry;

means for comparing said desired flow rate with said actual flow rate, electrically connected to said control logic circuitry said means for storing data representative of said flow rate and said pulse accumulator circuitry; and

means for enabling a solenoid activated valve in said meter valve system, electrically connected and responsive to signals from said means for comparing.

4,333,487

PNEUMATICALLY DRIVEN DRAINAGE FACILITY

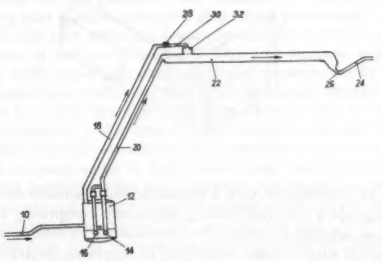
Harald Michael, Am Gosslers Park 9, 2000 Hamburg 55, Fed. Rep. of Germany

Filed Mar. 6, 1980, Ser. No. 127,913

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1979, 2908745

Int. Cl.³ C02C 1/00

U.S. Cl. 137—2 **11 Claims**



10. A method of causing fluid flow in a pneumatically driven drainage facility comprising the steps of: subjecting the lines of the facility to a change in pressure to cause fluid movement therethrough, said movement comprising the air and liquid travelling through the conduit in the form of alternating bodies of air and liquid, wherein the pneumatically driven air bodies drive the liquid bodies along the conduit, boosting the flow at at least one intermediate station by receiving air and liquid therein, collecting liquid, passing out the air through a first branch line which communicates with the intermediate station above the level of the collected liquid, pumping the liquid through a second branch line separated from the first branch line, and into a downstream descending conduit section, and delivering the air from the first branch line into the descending conduit section above the liquid therein.

4,333,488
METHOD OF TRANSPORTING VISCOUS HYDROCARBONS

Gifford G. McClaflin, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Sep. 8, 1980, Ser. No. 184,826
Int. Cl.³ F17D 1/17
U.S. Cl. 137—13 **7 Claims**

1. In the method of transporting a viscous hydrocarbon through a pipe the improvement which comprises forming an oil-in-water emulsion of lower viscosity to facilitate transporting said hydrocarbon through said pipe by adding to said hydrocarbon from about 20 to about 80 volume percent of an aqueous solution containing an effective amount, in the range of about 100 to about 3,000 parts per million by weight, based on said hydrocarbon of the adipate ester of a polyoxyethylene-polyoxypropylene block polymer, which is represented by the formula

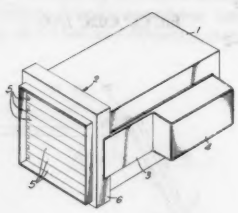
$$HO(CH_2CH_2O)_a(\underset{\displaystyle CH_3}{\underset{|}{C}}HCH_2O)_b(CH_2CH_2O)_cH$$

wherein a and c are numbers in the range of about 5 to about 20, with the sum of a and c being in the range of about 10 to about 40 and b is a number in the range of about 16 to about 30.

4,333,489
SPRING-MOTOR DUAL-FUNCTIONING MECHANISM

Robert J. Magill, Whitstable; Donald J. Lockley, and Richard J. Perrin, both of Herne Bay, all of England, assignors to Actionair Equipment Limited, Whitstable, England

Filed Sep. 7, 1979, Ser. No. 73,366
Claims priority, application United Kingdom, Sep. 11, 1978, 36293/78
Int. Cl.³ F16K 17/38, 17/40
U.S. Cl. 137—77 **10 Claims**

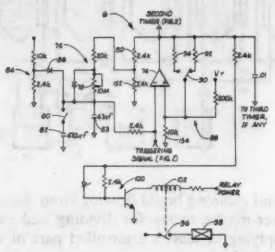


3. In combination with a releasable and resettable device: a spring-motor dual-functioning mechanism comprising a D.C. magnet actuable to release the releasable and resettable device, electrical supply means connected to supply an electrical current to said D.C. magnet to hold the latter in a non-releasing state, whereby said D.C. magnet is actuated when the holding electrical current ceases, detection means connected to said D.C. magnet to actuate the latter when conditions indicative of a fire are detected by said detection means, said D.C. magnet also being actuated in the event of failure of said supply of electrical current to said D.C. magnet, by said electrical supply means, a spring motor actuable to reset the device, and spring-winding means actuable to rewind said spring motor, the spring motor storage power being sufficient for at least two complete resetting operations of said mechanism before rewinding of said spring motor mechanism is necessary, in which said mechanism and said releasable and resettable device each have actuation members, those of the former being juxtaposed to those of the latter for actuation of said actuation members of said device by those of said mechanism thereby to allow the mechanism to be moved away from the releasable and resettable device for inspection without disconnection of said actuation members.

4,333,490
APPARATUS AND METHOD FOR CONTROLLING A WATERING SYSTEM

William L. Enter, Sr., 525 S. Aqua Clear Dr., Mustang, Okla. 73064

Filed Jan. 4, 1980, Ser. No. 109,542
Int. Cl.³ A01G 25/16
U.S. Cl. 137—78.3 **43 Claims**



1. An apparatus for automatically controlling a watering system in response to a comparison of an ambient condition with a time-varying reference level having an adjustable maximum value, said apparatus comprising:

monitor means for sensing the magnitude of the ambient condition and converting the sensed magnitude into a proportional electrical signal;

first timer means for generating a triggering signal when the time-varying reference level exceeds the magnitude of the proportional electrical signal;

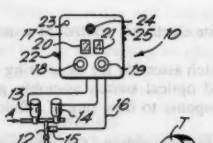
second timer means, responsive to the triggering signal, for actuating the watering system for a predetermined period of time; and

disabling means for comparing the proportional electrical signal with a predetermined cut-off level, and for preventing said first timer means from generating the triggering signal when the magnitude of the proportional electrical signal passes the cut-off level.

4,333,491
AIR DISPENSING APPARATUS

John S. Knubley, 1 Kia Ora, Barwis Hill, Penzance, Cornwall, England

Filed May 16, 1980, Ser. No. 150,644
Claims priority, application United Kingdom, May 18, 1979, 7917462; Oct. 16, 1979, 7935858
Int. Cl.³ B60C 23/04
U.S. Cl. 137—116.3 **16 Claims**



1. A vehicle tire inflation system comprising:

a pressure transducer adapted for connection to a vehicle tire to be responsive to the pressure therewithin for generating a corresponding output signal;

converter means responsive to an output signal from said

transducer for deriving a periodic signal having a frequency which is a function of the transducer output signal;

counter means coupled to the output of said converter means for counting excursions of the variable frequency signal produced thereby and providing output signals representative of the count accumulated;

time control means associated with said counter means for determining periods during which the output of said converter means is counted by said counter means whereby the count accumulated during each of said periods constitutes a measure of the transducer output during the respective period;

comparator means for comparing the count assembled in said counter means with a predetermined quantity representative of a desired tire pressure;

control means responsive to the result of said comparison for correspondingly adjusting the tire pressure; and

the operations of said comparator means and of said control means being arranged to occur at times determined by said time control means.

4,333,492

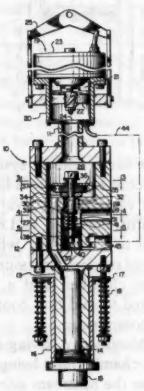
LIQUID INERTIA TOOL

Joe E. West, 111426 Goodnight La., Dallas, Tex. 75229

Division of Ser. No. 714,375, Aug. 16, 1976, abandoned. This application Dec. 10, 1979, Ser. No. 102,254

Int. Cl.³ F15B *11/15;* F16K *31/122*

U.S. Cl. 137—119 **7 Claims**



1. A valve mechanism for decelerating the flow of liquid in a ram tube, in order to derive a force from the inertia of the flowing liquid, comprising:

a valve housing;

a main bore in one end of said housing;

a least one force transmitting bore in the other end of said housing communicating with said main bore;

a central bore in said housing communicating at one end thereof with said main bore;

at least one generally transverse diverter bore in said housing communicating at its inner end with said central bore intermediate the ends thereof;

and a stem valve assembly mounted in said central bore comprising:

a stem;

a valve body carried on said stem and seatable against the bottom of said main bore;

valve closing means carried on said stem at one end thereof and reciprocable therewith in said main bore;

a valve opening piston mounted on said stem at the other end thereof, said piston being reciprocable in said central bore;

and means for delivering hydraulic pressure to the end face of said piston.

4,333,493

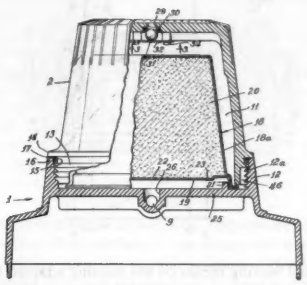
CARTRIDGE FEEDER FOR SOLUBLE FERTILIZER

John L. Beiswenger, Libertyville, Ill.; Howard R. Moon, Fort Atkinson, Wis.; Dhananjay V. Chaphalkar, Lindenhurst, and Frank A. Smiesko, McHenry, both of Ill., assignors to Acme Burgess, Inc., Grayslake, Ill.

Filed Mar. 28, 1980, Ser. No. 134,952

Int. Cl.³ B05B *7/14*

U.S. Cl. 137—268 **8 Claims**



1. A liquid fertilizer feeder comprising a base adapted to rest in stable upright position upon the ground and having a main water passageway therethrough, a fertilizer supply cartridge comprising a closed container containing granular solid fertilizer disposed atop said base, said cartridge container comprising an inverted frustoconical cup of plastic film and a flat closure for the otherwise open bottom thereof, the bottom of said container having a metering orifice and a solution outlet aperture at spaced apart locations therein, said metering orifice being located at the center of said closure and said solution outlet aperture being one of several apertures spaced around the periphery of said closure, a cover removably secured to the top of said base and providing with said base a watertight enclosure for said cartridge, said passageway having a converging inlet section and a diverging outlet section and a side branch inlet port and a side branch return port at spaced apart locations of said converging and diverging sections, respectively, in the top of said passageway and opening directly into said watertight enclosure, said inlet port being located upstream from said return port and directly under said metering orifice whereby a side branch water stream is directed from said inlet port against said cartridge container at said metering orifice to cause water to flow therethrough into the body of granular fertilizer within said container, said return port being open to said outlet aperture in said container whereby fertilizer solution may flow through said aperture and said return port into said main water passageway, and means atop said base and integral therewith for locating and retaining said cartridge coaxially with said side branch inlet port.

4,333,494

VALVE BOX

Thomas Shope, Kearny, N.J., assignor to CP Test Services - Valvco, Inc., Kearny, N.J.

Filed Jan. 30, 1980, Ser. No. 116,883

Int. Cl.³ F16L *5/00*

U.S. Cl. 137—364 **11 Claims**

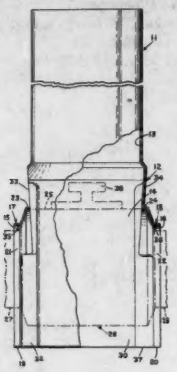
1. A valve box comprising

(a) a generally vertically elongated, hollow member open at its bottom;

(b) a hollow valve housing formed on the bottom of said member, the interiors of said member and housing communicating; the housing being open at its bottom end and

adapted to receive a valve body having diametrically opposed inlet and outlet conduits extending generally horizontally therefrom;

(c) at least two diametrically opposed inlet and outlet conduit receiving openings in the side of the housing, each said opening being closed at the top and communicating with the open bottom of the housing;



(d) internal bearing means on the housing adapted to engage the valve body to positively limit its upward movement in the housing; and

(e) the valve body engaging the bearing means when the said inlet and outlet conduits are vertically spaced away from the top of the respective conduit openings.

4,333,495

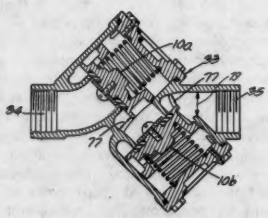
CHECK VALVE ASSEMBLY

David E. Griswold, Corona Del Mar, and Richard E. Veit, Morro Bay, both of Calif., assignors to Griswold Controls, Irvine, Calif.

Division of Ser. No. 10,987, Feb. 9, 1979, Pat. No. 4,244,395, which is a continuation-in-part of Ser. No. 410,173, Oct. 26, 1973, abandoned. This application Sep. 2, 1980, Ser. No. 183,583

Int. Cl.³ F16K *15/02*

U.S. Cl. 137—484.2 **2 Claims**



1. In a double check valve assembly having two duplicate check valves connected in series, the upstream check valve having an inlet terminal and the downstream check valve having a discharge terminal, said terminals being axially aligned, and a passage constituting the discharge passage for the upstream check valve and the inlet passage for the downstream check valve, the improvement comprising, in combination: each check valve having a stationary annular valve seat, and having a stationary barrel positioned coaxially of said valve seat, each check valve having a valve poppet guided for axial movement in its respective barrel and having a seal element adapted for sealing contact with its respective valve seat, each check valve having a spring acting to move its respective valve poppet into sealing contact with said valve seat, each valve poppet having an axis of movement disposed at an angle of about 45° with respect to the axis of said coaxial terminals, and each valve poppet having an axis of movement at substantially right angles to the axis of movement of the other valve poppet.

4,333,496

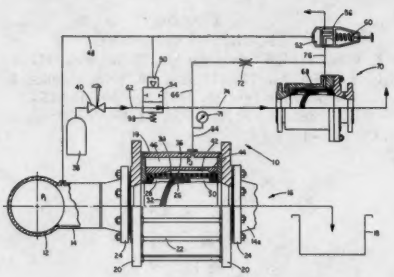
SURGE RELIEVER WITH INCREASE CAPACITY FLOW

Peter C. M. Chow, Newark, and William N. Ringer, Pleasant Hill, both of Calif., assignors to Grove Valve and Regulator Company, Oakland, Calif.

Filed Sep. 15, 1980, Ser. No. 186,858

Int. Cl.³ F16K *31/12*

U.S. Cl. 137—489 **10 Claims**



1. A liquid pipeline surge reliever system comprising:

a diverter line for connection into a liquid pipeline;

a main surge relief valve in said diverter line having a first pressure gas control chamber, said main valve being conditioned to open to a reservoir when liquid on the upstream side thereof reaches a pressure to overcome that in said first control chamber, and a source of gas under pressure connected to said first control chamber;

the improvement comprising:

a control pressure bleed valve having a smaller second pressure gas control chamber and being conditioned to open when pressure on the upstream side thereof exceeds that in said second control chamber;

one gas line connecting said first pressure control chamber to the inlet of said bleed valve and another gas line connecting said first control chamber to said second control chamber;

a pilot valve conditioned to open when pressure being sensed therein exceeds a predetermined set, pipeline surge pressure;

said second control chamber being connected to said pilot valve to be exhausted therethrough;

a sensing line conducting pipeline fluid to said pilot valve so that if pressure therein reaches said set pressure, the pilot valve opens to exhaust said second control chamber, enabling gas from said first control chamber to open said bleed valve;

a supply gas line connecting said pressure gas source to said first control chamber;

a pressure actuated on-off valve in said supply gas line conditioned to close when pressure sensed thereby approaches said set pressure; and

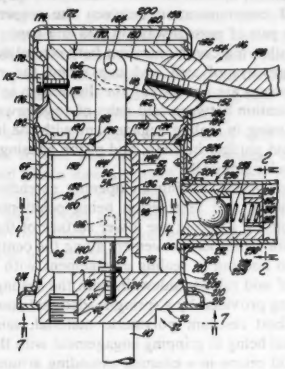
an actuating line connecting said sensing line to said on-off valve.

4,333,497

FAUCET ASSEMBLY WITH MIXING VALVE

Agustin A. Busquets, 6211 Pinetree Dr., Utica, Mich. 48087

Filed Oct. 9, 1979, Ser. No. 83,001
Int. Cl.³ F16K 11/02
U.S. Cl. 137—625.17 17 Claims



1. A mixing valve assembly comprising:

a valve housing closed at one end and open at its opposite end and having a circular bore defined by an inner wall portion, a hot water inlet port, a cold water inlet port circumferentially spaced from the hot water inlet port, and at least one outlet port;

a hollow control valve adapted to be slidably and rotatably mounted in said bore, the control valve including a cylindrical portion having circumferentially spaced passages formed therethrough and extending in a mixing chamber, said control valve having a pair of parallel guide members circumferentially spaced on the inner surface of the control valve and projecting into the mixing chamber,

a valve lid mounted over the open end of said valve housing and overlying the inner wall portion, the valve lid having an aperture formed therethrough and an apertured seal mounted about said aperture,

actuating means comprising a rotatable, slidable and elongated control stem passing through the seal of said apertured valve lid and including a cam engaging said parallel guides for rotating movement; the control stem having a free end disposed in the mixing chamber and having a cylindrical slot extending into the control stem from the free end,

guide means comprising a pin having one end mounted in the closed end of said valve housing and the other end defining a cylindrical stem slidably and rotatably mounted in the cylindrical slot of said control stem,

securing means comprising flanges formed at opposite ends of said cam and engaging said parallel guides for axial movement with said cam wherein axial displacement of said control stem regulates the degree to which the water inlet ports overlap said passages to control the volume of fluid entering the mixing chamber and rotatory movement of said control stem controlling the temperature of the mixed hot and cold water.

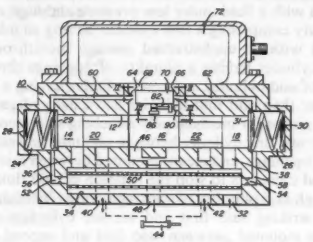
4,333,498

STEPPER MOTOR ACTUATED SERVOVALVE

Don W. Huling, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 5, 1980, Ser. No. 127,284
Int. Cl.³ F15B 13/043
U.S. Cl. 137—625.62 3 Claims

1. A servovalve comprising a valve body having a bore therein, a spool valve element reciprocable within said bore for controlling communication between an inlet pressure port in the valve body and a pair of output ports, opposed spring means carried in chambers located at opposite ends of said bore for urging said spool valve element into a null position where the input port is disconnected from both of said output ports, means for metering fluid under pressure from said input port to both of said chambers, opposed nozzles connected to the respective chambers and adapted to produce jet streams of fluid directed toward each other, a rotary valve member interposed between said nozzles and configured such that the jets impinge



thereon and the distance between the respective nozzles and at least a portion of the surface of the rotary valve member can differ depending upon the angular position of the rotary valve member about its axis of rotation, and stepper motor means for rotating said valve element in stepped increments;

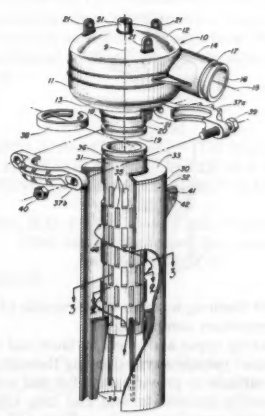
said rotary valve member comprising a cylinder rotatable about an axis normal to the flat end surfaces thereof, said cylinder including a groove in the periphery thereof, the cross-sectional area of which varies circumferentially therearound.

4,333,499

PRESSURE DISSIPATION APPARATUS

Jeffrey L. Beck, and William T. Sweeney, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Apr. 15, 1980, Ser. No. 140,516
Int. Cl.³ F15C 1/16; B04C 3/06
U.S. Cl. 137—812 1 Claim



1. In an apparatus for dissipating the pressure of confined slurry having:

(a) a housing having a sidewall means which has a substantially circular cross section normal to its vertical axis, a top and bottom means;

(b) inlet means formed into said sidewall wherein the axis of

said inlet means is tangent to a diameter of said substantially cylindrically-shaped sidewall so that said confined fluid entering said input into said housing forms a vortex over a location at said bottom and top means;

(c) outlet means extending through and from said bottom, said housing having a substantially unobstructed flow path for fluids fom said inlet to said outlet; and

(d) a fluid opening through said top aligned with said vortex; an apparatus for said velocity reduction from said outlet means comprising:

(e) an apparatus adapted to receive slurry comprising solids mixed with a fluid under low pressure and high rotational velocity comprising a first cylinder having an inlet and an outlet with an unobstructed passage therethrough, said first cylinder having a plurality of openings through the wall of said cylinder, a second cylinder having a diameter greater than said first cylinder and axially aligned therewith, means for mechanically attaching said second cylinder to said first cylinder between said inlet and said plurality of openings, and means mounted between said first and second cylinders to stop the rotation of said fluid passing through said plurality of openings caused by high velocity fluid striking said first and second cylinders and said means mounted between said first and second cylinder whereby said solid portion of said slurry can pass unobstructed through said first cylinder from said inlet to said outlet and said fluid can pass through said plurality of openings to said second cylinder striking said means for stopping rotation and wherein said fluid can then fall from said second cylinder terminus.

4,333,500

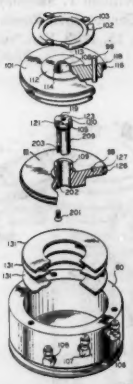
FLUID ACTUATED VALVE

Arthur B. Broerman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 23, 1980, Ser. No. 152,907

Int. Cl.³ F16K *11/22*; G01N *1/10*

U.S. Cl. 137—863 **10 Claims**



1. A multi-port diaphragm-sealed valve capable of operating at elevated temperatures comprising:

an end cap having upper and lower surfaces and a plurality of spaced-apart passageways extending through the upper and lower surfaces to provide ports for said valve;

a plunger housing secured to said end cap, said plunger housing having upper and lower surfaces and a plurality of spaced-apart passageways extending through the upper and lower surfaces of said plunger housing and being positioned such that each said passageway of said plunger housing will be positioned between a different pair of the passageways of said plunger housing;

a diaphragm positioned between the lower surface of said end cap and the upper surface of said plunger housing and extending over the open ends of the passageways of both said end cap and said plunger housing;

a plurality of plunger means each being positioned in and extending through a respective one of the passageways of said plunger housing such that actuating means on the lower surface of the plunger housing can force each said plunger means upward so that it causes the diaphragm to block off communication between the respective surrounding pair of passageways in said end cap;

means for allowing communication between adjacent pairs of passageways of said end cap when the respective plunger means are not forcing the diaphragm to block off communication between said pairs of passageways;

a piston housing in sealing engagement with the lower surface of said plunger housing, said piston housing comprising a tubular sidewall;

a first piston means having an opening extending axially therethrough, said first piston being positioned in said piston housing adjacent the lower surface of the plunger housing for reciprocal movement along the central axis of the piston housing in sealing engagement with the inner surface of said tubular sidewall, with the sealing engagement being provided by a spring-loaded seal comprising a ring of heat resistant polymeric material, said spring-loaded seal being in gripping engagement with the periphery of said piston in a channel extending around the periphery of said first piston, wherein the one edge of the channel extends outwardly farther than the other edge of the channel and the edge that extends outwardly the least tapers inwardly away from the channel in such a manner as to permit the spring-loaded seal to be readily snapped into said channel, and wherein the upper surface of said first piston has a configuration such that a first chamber is formed between the outer portions thereof and the lower surface of said plunger housing, and such that when said first piston is in its upper position it will force a first set of said plunger means to force the diaphragm against the end cap to block off communication between the pair of passageways in the end cap surrounding each plunger means of that first set;

a second piston means being positioned in said piston housing below said first piston means for reciprocal movement along the central axis of the piston housing in sealing engagement with the inner surface of said tubular sidewall, with the sealing engagement being provided by a spring-loaded seal comprising a ring of heat resistant polymeric material, said spring-loaded seal being in gripping engagement with the periphery of said second piston in a channel extending around the periphery of said second piston wherein one edge of the channel extends outwardly further than the other edge of the channel and the edge that extends outwardly the least tapers inwardly away from the channel in such a manner as to permit the spring-loaded seal to be readily snapped in said channel, said second piston means containing a projecting portion which extends upwardly from the upper face of said second piston through the opening in said first piston for reciprocal movement in said opening in sealing engagement with said first piston, said sealing engagement being provided by a spring-loaded seal comprising a ring of heat resistant polymeric material, said spring-loaded seal being in gripping engagement with the periphery of said projecting portion in a channel extending around said projecting portion, wherein at least the upper portion of the projecting portion can be separated to allow said sealing ring to be readily placed in said channel of said projecting portion, and wherein the projecting portion is of such length and its upper surface of such configuration that when the second piston is in its uppermost position it will force a second set of said plunger means to force the diaphragm against the end cap to block off communication between the pair of passageways in the end cap surrounding each plunger of that second set, and wherein the

lower surface of said first piston and the upper surface of said second piston are such that even when the second piston is in its uppermost position there is a gap between the outer portions thereof so as to define a second chamber; and wherein said second piston means includes a securement means for securing the separable portion of the projecting portion to said second piston;

first spring means positioned between the lower surface of said plunger housing and said first piston means to urge said first piston means away from said plunger housing;

second spring means positioned beneath the lower surface of said second piston means for urging said second piston means toward said plunger housing;

spring securement means for securing said second spring means so that said second spring means will urge said second piston means toward said plunger housing;

a fluid passageway extending through said piston housing into said second chamber, through which fluid can be passed to cause said first and second pistons to move relative to each other.

4,333,501

WEAVING MACHINE HAVING A RIGID FRAME

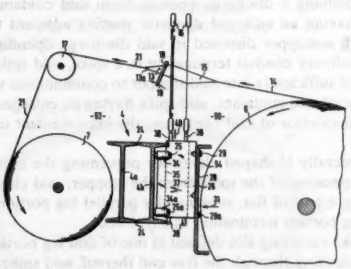
Otto Hintsch, Wallisellen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Mar. 17, 1980, Ser. No. 131,114

Claims priority, application Switzerland, Mar. 28, 1979, 2871/79

Int. Cl.³ D03D *49/02*

U.S. Cl. 139—1 R **9 Claims**



1. In a weaving machine having a machine frame including a warp beam end, a cloth beam end, a main girder extending across said frame between said ends, a supplementary girder parallel to and spaced from said main girder at said warp beam end, said supplementary girder being U-shaped in cross-section with a pair of flanges directed towards said warp end of said machine frame and a plurality of drive members located between said girders for vertically driving a plurality of shed-forming shafts;

at least one connecting member secured to and between said girders to form a rigid connection between said girders,

a guide mounted on said connecting member for guiding said drive members therein, and

a warp beam mounted at said warp beam end of said frame and projecting into and between said flanges of said supplementary girder.

4,333,502

FORMING FABRICS FOR PAPER-MAKING MACHINES AND METHODS OF MANUFACTURE THEREOF

Robert Karm, Selestat, France, assignor to Martel Catala & Cie, Selestat, France

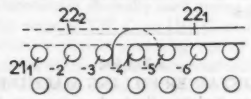
Continuation-in-part of Ser. No. 780,249, Mar. 22, 1977, Pat. No. 4,171,009. This application May 2, 1979, Ser. No. 35,416

Claims priority, application France, Nov. 7, 1977, 77 33394

The portion of the term of this patent subsequent to Oct. 16, 1996, has been disclaimed.

Int. Cl.³ D03D *15/00, 15/02;* B21F *1/10;* B10D *39/08*

U.S. Cl. 139—425 A **9 Claims**



1. Endless forming fabric for paper-making machine and the like, comprising:

an upper layer of threads transverse to the direction of movement of the fabric on the machine and located on the material forming side of the fabric,

a lower layer of threads transverse to said direction of movement and located on the wear side of the fabric,

and longitudinal threads interwoven with the layers of transverse threads,

wherein all outer loops formed by the longitudinal threads over the transverse threads of the upper layer bind with from 3 to 7 transverse threads of the upper layer and the first points of crossing of said outer loops with the transverse threads are distributed according to a weaving pattern comprising at least five longitudinal threads,

and the weaving pattern on the outer surface of the fabric which supports the material to be formed is of a type without alignments of said loops on adjacent threads and without diagonal effects,

wherein the longitudinal threads from lower loops each binding with one transverse thread of the lower layer on the wear side of the fabric,

and wherein said outer loops formed by the longitudinal threads over the transverse threads of the upper layer are so located that there is no gap in the longitudinal direction between each individual said outer loop of each said longitudinal thread and outer loops of the adjacent longitudinal threads.

4,333,503

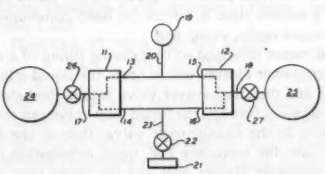
SYSTEM AND METHODS WITH SCAVENGING CAPABILITIES FOR SIMULTANEOUSLY FILLING AND EVACUATING A PLURALITY OF SEPARATE PRESSURE VESSELS

John Stefiuk, R.D. #1 Bunker Hill Rd., Princeton, N.J. 08540

Filed Jan. 30, 1980, Ser. No. 116,881

Int. Cl.³ B65B *31/00*

U.S. Cl. 141—8 **4 Claims**



1. A system with scavenging capability for simultaneously filling a first vessel with a pressurized fluid and evacuating a second vessel comprising:

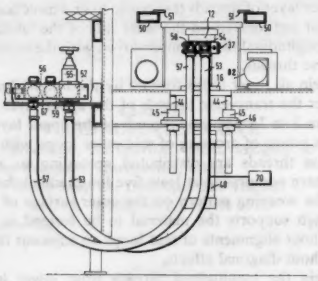
(a) at least two multi-position valve means, each valve means having at least two inlets and at least one outlet;
(b) one of each of the inlets of each said multi-position valve means connected respectively to a source of fluid under pressure and a source of vacuum, the inlets of each multi-position valve means connected to the source of vacuum being also operatively connected to each other, and
(c) an outlet of each of the multi-position valve means being operatively connectable to at least one vessel valve means which is in turn proximal to and connectable to a vessel;
(d) each multi-position valve means being operable to connect the vessel valve means to which it is connected to the other vessel valve means through the other multi-position valve means.

4,333,504

CONTAINER FILLING MACHINE

Cyril G. Golding, Sedgley, England, assignor to GKN Sankey Telford, England

Filed May 7, 1980, Ser. No. 147,495
Claims priority, application United Kingdom, May 12, 1979, 7916585
Int. Cl.³ B65B *31/00*
U.S. Cl. 141—55 **4 Claims**



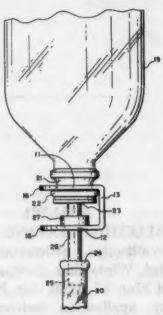
1. A machine for filling with liquid containers having spring-loaded closure units, the filling being carried out via a head which seals with a container to be filled and which carries means to open the closure unit of said container, the machine comprising:
a main frame and a filling head movable relative to the frame to engage a container to be filled,
a liquid inlet valve on the frame and a conduit from the liquid inlet valve to a change-over valve fixed to the head,
a liquid outlet valve on the frame and a conduit from the liquid outlet valve to the change-over valve,
a gas inlet valve fixed on the frame and a conduit from the gas inlet valve to the head,
said change-over valve being operable in synchronism with the liquid inlet valve,
the change-over valve being adjustable to a first state in which the head communicates with the liquid inlet valve and a second state in which the head communicates wih the liquid outlet valve, and,
control means arranged so that during filling of a container the container closure unit is open, the liquid inlet valve is open and the change-over valve is in its first state so that liquid passes through the liquid inlet valve and the conduit from it to the change-over valve, then to the head and then into the container and, upon termination of filling, the container closure unit and the liquid inlet valve are closed, the change-over valve is changed over to its second state and the gas inlet valve is opened so that gas can flow from the gas inlet valve through the conduit from it to the head to enable the gas to clear the head of liquid which is driven by the gas through the change-over valve into the conduit therefrom to the liquid outlet valve.

4,333,505

CLAMP FOR PREVENTING THE UNINTENTIONAL SEPARATION OF A CONDUIT FROM A CONTAINER

William L. Jones, Victor, N.Y., and Jon A. Christensen, Lake Zurich, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jul. 7, 1980, Ser. No. 166,212
Int. Cl.³ B65B *3/00*
U.S. Cl. 141—383 **1 Claim**



1. In a fluid assembly including a container suspended in an inverted position, said container having a relatively narrow neck defining a discharge opening from said container, said neck having an enlarged diameter portion adjacent the end thereof, a stopper disposed in said discharge opening and a fluid delivery conduit terminating in a spike, said spike being inserted sufficiently into said stopper to communicate with the interior of said container, said spike having an enlarged flange portion exterior of said container, the improvement comprising:
a generally U-shaped clamp for preventing the unintended separation of the spike from the stopper, said clamp having a pair of flat, substantially parallel leg portions, each leg portion terminating in a free end;
a spike-receiving slot defined in one of said leg portions and extending through the free end thereof, said spike-receiving slot having a width less than the width of said flange to prevent said flange from passing therethrough;
the other of said leg portions defining a neck-receiving aperture therein and a slot communicating between said aperture and the free end of said other leg portion, said neck-receiving aperture being smaller than said enlarged diameter portion of the container neck to prevent withdrawal of the neck through said aperture, said communicating slot having a width smaller than the width of said container neck and said other leg portion being sufficiently resilient to permit temporary spreading of said communicating slot to receive said container neck being disposed in neck-receiving aperture of said other leg portion, whereby said enlarged diameter neck portion and said spike flange are captured between said leg portions of said clamp, said clamp thereby preventing unintended separation of said spike from said stopper.

4,333,506

PENCIL SHARPENER

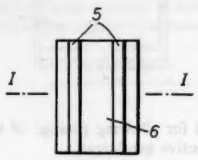
Werner Möbius, Hindenburgstrasse 77, 8520 Erlangen, Fed. Rep. of Germany

Continuation of Ser. No. 935,976, Aug. 22, 1978, abandoned. This application Jul. 11, 1979, Ser. No. 56,523

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1977, 7731410[U]

Int. Cl.³ B43L *23/00*

U.S. Cl. 145—3.1 4 Claims



1. A hand held pencil sharpener comprising a metallic body member of rectangular cross-section, said body member having a longitudinal pencil opening, sharpening means associated with said pencil opening and a pair of external gripping surfaces on opposite sides of said body member independent from said pencil opening and said sharpening means, each gripping surface comprising at least three longitudinal ridges having equal width, a longitudinal recess between each pair of adjacent ridges, each recess having a planar bottom surface, planar side walls and a substantially rectangular cross-section, and said recesses being equal in width.

4,333,507

TIRE WITH COMPOSITE REINFORCEMENT CORD

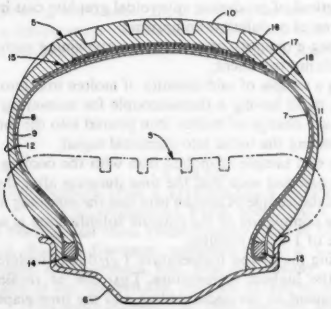
Georges J. E. Schmit, Bridel, and Thomas N. H. Welter, Keispelt, both of Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 916,271, Jun. 16, 1978. This application Nov. 20, 1980, Ser. No. 208,706

The portion of the term of this patent subsequent to Dec. 23, 1997, has been disclaimed.

Int. Cl.³ B60C *9/00;* D02G *3/36*

U.S. Cl. 152—359 9 Claims



1. A tire having at least one part reinforced with a plurality of composite cords, each of which initially prior to vulcanization comprises at least one high tenacity, substantially inextensible yarn spirally wrapped around a core, said core including at least one filament having at room temperature an elastic limit of at least 2.5 kilograms and a modulus of elasticity greater than 25 grams per denier to resist and recover from tension forces on the cord during the processing of said cord and tire and said core having a reduction in tenacity after being subjected to temperatures normally used during vulcanization of the tire of at least 120° C. and cooling to a lower temperature to permit stretching out of said yarn to allow for elongation of the tire and then reinforcing of the tire in the elongated condition when said yarn is stretched out.

2. A tire having at least one part reinforced with a plurality of composite cords, each of which initially prior to vulcanization comprises at least one high tenacity, substantially inextensible continuous yarn spirally wrapped around a core, said core including at least one filament having at room temperature an elastic limit of at least 2.5 kilograms and a modulus of elasticity greater than 25 grams per denier to resist and recover from tension forces on the cord during the processing of said cord and tire and said core having a reduction in tenacity after being subjected to temperatures normally used during vulcanization of the tire in the range of 120° C. to 150° C. and cooling to a lower temperature to permit stretching out of said yarn to allow for elongation of the tire and then reinforcing of the tire in the elongated condition when said yarn is stretched out.

4,333,508

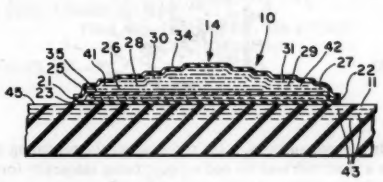
TIRE REPAIR PATCH FOR SIDEWALL AND BEAD REPAIRS

Jobbie DiRocco, 3424 Sweetbriar Ave., Akron, Ohio 44321, and David J. DiRocco, 7090 Grove Rd., Clinton, Ohio 44216

Filed Jun. 1, 1981, Ser. No. 268,874

Int. Cl.³ B60C *21/02, 21/04*

U.S. Cl. 152—367 12 Claims



1. A tire sidewall repair patch for application to the inner surface of a tire sidewall at a tire sidewall injury comprising a plurality of overlapping plies of reinforcing cords, a central portion for positioning over said tire injury, an inner margin having an inner edge adapted to conform generally to the shape of the bead portion of a tire, some of said plies of reinforcing cords extending into only one side portion of said inner margin and an additional number of said plies extending into only the other side portion of said inner margin so that there will be a concentration of said plies at said central portion to provide strength and a reduction in plies in each said side portion to provide flexibility of said patch in the area of the side portions of said patch.

4,333,509

SECTIONAL VENETIAN BLINDS

William H. Conn, Pasadena, Calif., assignor to Ohline Corporation, Gardena, Calif.

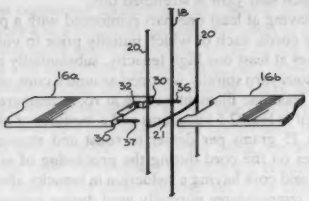
Filed Oct. 22, 1979, Ser. No. 87,029

Int. Cl.³ E06B *9/386*

U.S. Cl. 160—173 15 Claims

1. A Venetian blind having a plurality of slats supported in spaced relationship by a support structure which includes at least a pair of lift strings threaded through the slats in positions on opposite sides of the center plane of the blind, at least one of the slats being constructed in sections situated on opposite sides of a lift string, the sectioned slat having a joint encircling the lift string, said joint comprising adjacent end portions of said slat sections shaped for joining together in abutting relationship and concealed joining means encased within said end

portions, said joining means comprising a plurality of pins mounted to extend from at least one abutting end portion for



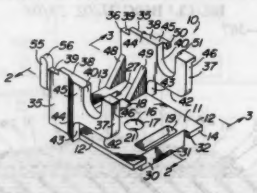
insertion into the other abutting end portion so as to be totally concealed within the sectioned slat joint.

4,333,510

TILT ROD SUPPORT FOR A VENETIAN BLIND

Mark A. Fox, Montoursville, Pa., assignor to Marathon Manufacturing Company, Houston, Tex.

Filed Dec. 29, 1980, Ser. No. 216,776
Int. Cl.³ E06B 9/38
U.S. Cl. 160—177 **11 Claims**



1. In a venetian blind, a tilt rod support for mounting a tilt rod in a head rail: said tilt rod support being integrally formed of plastic material and comprising a base for resting in a head rail, nether boss means on said base for conformably engaging through the bottom of said head rail, retainer means on said boss means for retaining engagement with the bottom of said head rail, a pair of spaced walls upstanding from said base and terminating at upper edges, said walls each having a cut-out extending downwardly through its upper edge and defining of the adjacent wall portion a pair of upstanding legs, said cut-outs being in general alignment with each other and adapted to rotatably receive a tilt rod, and projections on at least one pair of said legs extending into the upper region of the associated cut-out, said projections and said one pair of legs being resiliently deflectable to snap pass and releasably retain a tilt rod in said associated cut-out.

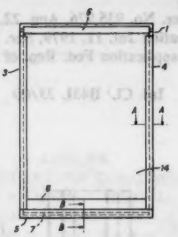
4,333,511

WINDOW INSULATIONS

David R. Johnston, Reading, England

Filed Oct. 9, 1979, Ser. No. 82,589
Claims priority, application United Kingdom, Oct. 10, 1978, 39979/78
Int. Cl.³ E06B 9/20, 9/208
U.S. Cl. 160—267 R **12 Claims**

1. A thermal insulation arrangement for a window or door in a frame, the arrangement comprising a spring-loaded roller mounted across the top of the frame, a flexible sheet wound on the roller of such a shape and size as to fill the frame when drawn down from the roller, a stiffening bar along the free end of the sheet, channel members mounted down the sides of the frame, and flexible plastic brush seals mounted in the channel members, wherein said stiffening bar is respectively extended into said channel members between the brush seals, the brush seals respectively slidably engaging both faces of the sheet at the side edges thereof for air sealing between the respective brush seals and the respective faces of the sheet at the side



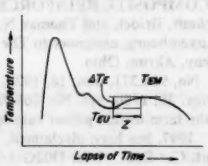
edges thereof and for allowing passage of the stiffening bar between the respective brush seals.

4,333,512

METHOD OF QUICKLY PREDICTING THE DEGREE OF NODULARITY OF SPHEROIDAL GRAPHITE CAST IRON FROM A MOLTEN IRON SAMPLE

Taku Sugiura, Nagoya; Katsuya Fukuoka, Chita; Tomihiko Inoue, Tsushima; Masayoshi Kanbe, Toyoake, and Toshio Iwama, Nagoya, all of Japan, assignors to Yahagi Iron Co., Ltd., Nagoya, Japan

Filed May 15, 1979, Ser. No. 39,432
Claims priority, application Japan, May 17, 1978, 53-58640
Int. Cl.³ B22D 2/00
U.S. Cl. 164—453 **5 Claims**



1. A method of producing spheroidal graphite cast iron of a high degree of nodularity, comprising:

subjecting a quantity of molten iron containing carbon to a nodulizing treatment;

pouring a sample of said quantity of molten iron into a sampling mold having a thermocouple for measuring a temperature change of molten iron poured into the mold and converting the value into electrical signal;

cooling said sample of molten iron with the cooling conditions adjusted such that the time duration after the pouring of the sample of molten iron into the sampling mold up to the completion of the eutectic solidification is within a range of 1 to 10 minutes;

measuring the lowest temperature T_{EU} due to undercooling and the highest temperature T_{EM} due to recalescence subsequent to the undercooling and the time elapsed (Z) between the occurrence of the lowest temperature T_{EU} and the occurrence of the highest tmperature T_{EM} by said thermocouple during the cooling period;

sampling the analogue signals derived from said thermocouple at predetermined short time intervals of less than 3 seconds in sampling means;

converting the sampled analogue signal into a digital signal in an analogue-digital converter;

successively determining and storing in a computer the values for the lowest temperature T_{EU} due to undercooling and for the highest temperature T_{EM} due to recalescence subsequent to the undercooling;

determining and storing in the computer the elapsed time Z from the occurrence of the lowest temperature T_{EU} and the occurrence of the highest temperature T_{EM};

storing in the computer predetermined constants (a, b, c, e);

processing the value of the degree to be determined of nodularity from the temperature T_{EM}, T_{EU}, the constants (a, b, c, e) and the measured time (Z) according to a predetermined function $(a+bT_{EM}+c\Delta T_E+eZ)$ in an operational processing circuit of the computer;

displaying the achieved value of the degree of nodularity with a digital or analogue display; and

casting the rest of said quantity of molten iron if the displayed value of the degree of nodularity is at least 61%.

4,333,513

CATECHOL RESINS FOR THE SHELL PROCESS

Robert S. Craig, Hoffman Estates, Ill., assignor to Acme Resin Corporation, Englewood Cliffs, N.J.

Division of Ser. No. 90,388, Nov. 1, 1979, Pat. No. 4,281,090, which is a division of Ser. No. 869,407, Jan. 16, 1978, Pat. No. 4,206,262. This application Mar. 5, 1981, Ser. No. 240,641

Int. Cl.³ B22C *1/22*

U.S. Cl. 164—526 **5 Claims**

1. A process for forming foundry cores and molds comprising the steps of:

(1) contacting a hot pattern with a free-flowing resin-coated sand comprising

(a) particles of sand coated with from about 1% to 8%, by weight of the sand, of a novolak resin; consisting essentially of from about 50% to about 98% of a phenol-formaldehyde novolak resin and from about 2% to about 50% of a catechol-formaldehyde agent;

(b) a curing agent;

(2) holding the resin-coated sand against the hot pattern to bond a portion of the particles of resin-coated sand together to form a foundry mold or core of suitable thickness;

(3) removing unbonded particles of resin-coated sand from bonded particles of sand forming the foundry mold or core;

(4) curing the foundry mold or core, the hot pattern having a temperature of from about 300° F. to 700° F.; and

(5) removing the foundry mold or core from the pattern.

4,333,514

SUSPENSION FOR A THERMALLY HEAVY LOAD CYLINDRICAL PIPE ASSEMBLY

Rolf Dörling, and Hans Hemschemeier, both of Gummersbach, Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

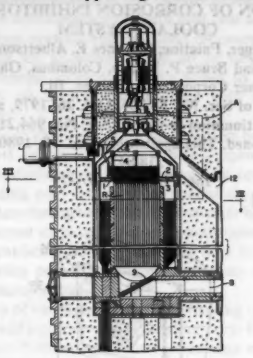
Division of Ser. No. 960,834, Nov. 15, 1978, Pat. No. 4,258,781. This application Jul. 30, 1980, Ser. No. 173,468

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1977, 2750924

Int. Cl.³ F28F *9/00*

U.S. Cl. 165—1 **1 Claim**

1. In a method of cooling a suspension plate having means forming chambers and forming a part of a suspension permitting an effective cooling for a thermally heavy load cylindrical pipe assembly having an axis with a high-temperature reactor with cooled-off heat carrier gas. the improvement in combination therewith which comprises the steps of uniformaly distributing and utilizing gas from the reactor over the entire pipe assembly as cooling medium for the suspension plate for the pipes and the hollow supporting structure including therewith



at least a portion of the cooled-off heat carrier gas of the high-temperature reactor.

4,333,515

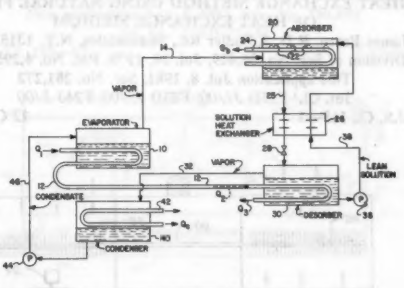
PROCESS AND SYSTEM FOR BOOSTING THE TEMPERATURE OF SENSIBLE WASTE HEAT SOURCES

William H. Wilkinson, Columbus, and William T. Hanna, Gahanna, both of Ohio, assignors to Battelle Development Corp., Columbus, Ohio

Filed Aug. 13, 1980, Ser. No. 177,663

Int. Cl.³ F25B *15/00*

U.S. Cl. 165—1 **15 Claims**



1. A process for boosting the temperature of a sensible waste heat source available at a first temperature to a higher second temperature comprising the steps of:

(a) supplying heat from said waste heat source and utilizing a portion of it to evaporate a refrigerant at a relatively high pressure to form a refrigerant vapor,

(b) contacting said refrigerant vapor with a liquid solution of an absorbent and said refrigerant which is relatively lean in refrigerant to absorb at least a portion of said refrigerant vapor into solution, thereby releasing heat to an external process stream at said higher second temperature,

(c) passing the resultant relatively refrigerant rich solution to an area of relatively lower pressure and supplying a succeeding portion of heat from said waste heat source to desorb at least a portion of the refrigerant from said refrigerant rich solution as vapor thereby forming a refrigerant lean solution,

(d) recycling said refrigerant lean solution to again contact it with refrigerant vapor from said evaporating step,

(e) condensing at least a portion of the desorbed refrigerant vapor to form a refrigerant liquid, and

(f) returning the condensed refrigerant liquid to said evaporating step.

4,333,516

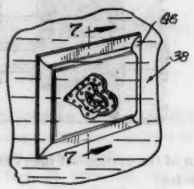
CORRODIBLE CONTAINER FOR AUTOMATIC ADDITION OF CORROSION INHIBITOR TO A COOLANT SYSTEM

Robert H. Krueger, Palatine; Clarence E. Albertson, Villa Park, both of Ill., and Bruce P. Miglin, Columbus, Ohio, assignors to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 88,506, Oct. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 964,219, Nov. 27, 1978, abandoned. This application Dec. 10, 1980, Ser. No. 214,843

Int. Cl.³ F28F *19/00*

U.S. Cl. 165—1 **36 Claims**



8. The method as set forth in claim 1, including the step of providing an expandible anhydrous salt as a corrosion inhibitor in the container so that upon penetration of the container portion by the coolant to contact the salt, the salt rapidly expands to rupture said container portion and allow release of the inhibitor.

4,333,517

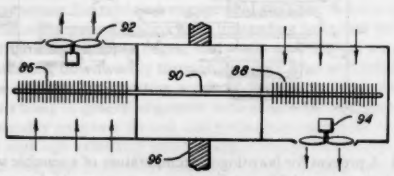
HEAT EXCHANGE METHOD USING NATURAL FLOW OF HEAT EXCHANGE MEDIUM

James Parro, R.D. 2, Sadler Rd., Skaneateles, N.Y. 13152

Division of Ser. No. 56,419, Jul. 10, 1979, Pat. No. 4,295,342. This application Jul. 8, 1981, Ser. No. 281,272

Int. Cl.³ F25D *31/00;* **F23D** *15/00;* **F24J** *3/00*

U.S. Cl. 165—1 **12 Claims**



1. A method of reducing energy losses and of eliminating undesired transfer of air between the interior and exterior of an enclosed room in heating, ventilating and air conditioning applications by reversible heat exchange between room air and outside air, comprising:

(a) providing a pair of continuous heat exchange coils each having an upper and a lower end and a plurality of substantially horizontal portions therebetween;

(b) placing the upper ends of said coils at a vertical level substantially higher than the lower ends of each coil;

(c) connecting said upper ends for direct communication through a connecting line and connecting said lower ends for direct communication through a connecting line;

(d) charging said coils with a heat exchange liquid to a level substantially above the lower ends and below the upper ends of both of said coils; and

(e) placing said coils on opposite sides of a wall separating the room from the outside with said lines connecting said upper and lower ends passing through said wall, thereby contacting one of said coils only with room air and the other only with outside air, whereby refrigerant is evaporated from the inside coil when room air is warmer than outside air, and vice versa, thereby increasing the pressure in the coil from which refrigerant is evaporated and causing refrigerant to flow to the other coil giving up heat to the air at the lowest temperature.

4,333,518

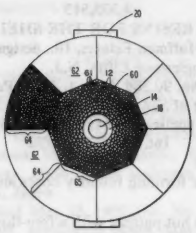
METHOD FOR IMPROVING THERMAL SHOCK RESISTANCE OF HONEYCOMBED STRUCTURES FORMED FROM JOINED CELLULAR SEGMENTS

Rodney I. Frost, Corning; Robert D. McBrayer, Painted Post, and Vimal K. Pujari, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 10, 1980, Ser. No. 205,776

Int. Cl.³ B32B *3/12, 1/08*

U.S. Cl. 165—8 **18 Claims**



1. A method of improving the thermal shock resistance of honeycombed outer surface of a structure fabricated from ceramic, glass-ceramic, glass, sintered metal or cermet, said surface being formed from a plurality of cellular segments, said segments each being joined to one another along side walls by a bond joint of cement therebetween, said cement formed from ceramic, glass-ceramic, glass, sinterable metal, cermet or other ceramic base materials, comprising the steps of:

bonding each of said cellular segments to another of said cellular segments along one of said side walls of each so as to form a cement bond joint therebetween; and

recessing a substantial plurality of said cement bond joints from said honeycombed surface whereby the thermal shock resistance of said surface is improved.

4,333,519

CONTROLLER FOR AIR CONDITIONING UNITS, HEATING UNITS AND THE LIKE

Doron Shafrir, 4 Ross Ave., Spring Valley, N.Y. 10977, and Jeffrey Lamb, 172-41 Highland Ave., Jamaica Estates, N.Y. 11432

Filed May 8, 1980, Ser. No. 148,059

Int. Cl.³ F25B *29/00;* **F23N** *5/20*

U.S. Cl. 165—12 **36 Claims**

1. A controller for a system of the type which regulates the temperature in a space, said system including a first energy consuming component and an energy source for activating said component when said energy source is connected thereto, said controller comprising:

a first preset temperature sensitive device for providing a first output signal at a first predetermined temperature;

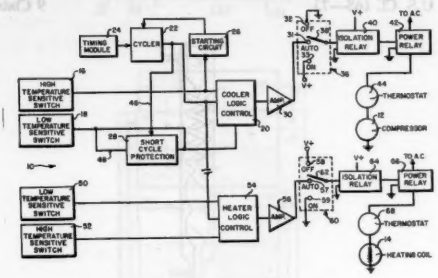
a second preset temperature sensitive device for providing a second output signal at a second predetermined temperature, said second predetermined temperature being lower than said first predetermined temperature;

means for generating a third output signal having a first predetermined duty cycle;

first switch means operatively connected to said energy source and said first energy consuming component, said

switch means being operable in a first mode wherein said switch means interrupts the connection between said energy source and said first component, and a second mode wherein the connection between said energy source and said first component is uninterrupted by said switch means; and

first control means operatively connected to said first, second and third output signals, and said first switch means, for



(a) operating said switch means in one of said first and second modes when said first output signal is present at said control means,

(b) cycling said switch means between said first and second modes according to said first predetermined duty cycle when neither of said first and second output signals is present at said control means, and

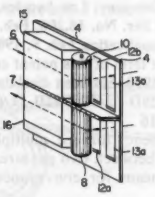
(c) operating said switch means in the other of said first and second modes when said second output signal is present at said control means.

4,333,520

HEATING AND COOLING VENTILATING SYSTEM WITH HEAT RECOVERY

Michio Yanadori, Hachioji; Kengo Hasegawa, Sakura, and Motokazu Uchida, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 3, 1980, Ser. No. 156,116
Claims priority, application Japan, Jun. 4, 1979, 54-68959
Int. Cl.³ F24F *7/00*; F28D *15/00*
U.S. Cl. 165—59 **6 Claims**



1. A ventilating system comprising:

a cabinet;

a heat exchanger utilizing boiling and condensation of a fluid mounted in said casing;

a first air passage and a second air passage defined in said cabinet by a partition plate extending horizontally across said heat exchanger substantially in the center thereof; and

at least one air sucking and exhausting fan mounted in one of said first air passage and said second air passage; wherein the improvement comprises:

at least one auxiliary heat exchanger functioning as a cooler when space cooling is effected by said ventilating system and a heater when space heating is effected thereby;

a ventilating port for effecting heat recovery and a ventilating port for allowing cooled air or heated air to flow therethrough formed in said cabinet to cooperate with one air duct communicationg with said first air passage;

a ventilating port for effecting heat recovery and a ventilating port for allowing cooled air or heated air to flow therethrough formed in said cabinet to cooperate with another air duct communicating with said second air passage;

a plurality of shutters, one of said shutters being mounted in said first air passage for alternately opening and closing said ventilating port for effecting heat recovery and said ventilating port for allowing cooled air or heated air to flow therethrough and the other shutter being mounted in said second air passage for alternately opening and closing said ventilating port for effecting heat recovery and said ventilating port for allowing cooled air or heated air to flow therethrough; and

a plurality of ventilating ports for effecting cooling by ventilation and a plurality of ventilating ports for effecting heat recovery formed in said first air passage and a plurality of ventilating ports for effecting cooling by ventilation and a plurality of ventilating ports for effecting heat recovery formed in said second air passage;

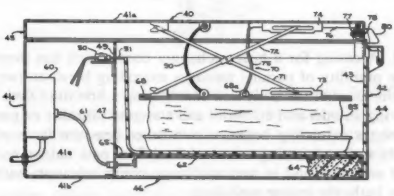
wherein said various ventilating ports are alternately opened and closed to suit the conditions of operating the ventilating system in a heat recovery mode, a cooling by ventilation mode, and a space cooling or space heating mode.

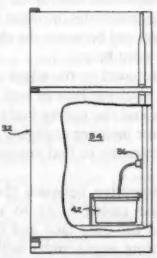
4,333,521

APPARATUS FOR THAWING FROZEN FOOD

Richard L. Stottman, Lima, Ohio, and Peter H. Smith, Anchorage, Ky., assignors to General Electric Company, Louisville, Ky.

Division of Ser. No. 108,755, Dec. 31, 1979, Pat. No. 4,296,299.
This application Apr. 2, 1981, Ser. No. 250,493
Int. Cl.³ F25B *29/00*
U.S. Cl. 165—63 **5 Claims**





1. A refrigerator comprising:

a food storage compartment;

means for maintaining the food storage compartment at a relatively cool temperature for food preservation purposes;

a food thawing enclosure including top, bottom and side walls comprised of electromagnetic radiation shielding

material within said food storage compartment and being in good thermal communication with the food storage compartment, said enclosure having a pair of electrodes therein defining a food thawing zone;

means providing access to said enclosure for enabling removable insertion of frozen food into said food thawing zone;

and means for supplying high frequency electromagnetic energy to said electrodes;

whereby the frozen food may be thawed and allowed to remain in said enclosure subsequent to thawing, the temperature within said enclosure being substantially at the temperature of the food storage compartment thus preventing spoilage of the thawed food.

4,333,522

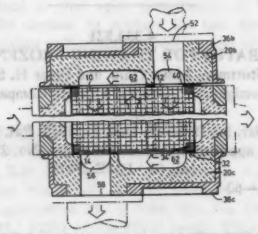
CASINGS FOR HEAT EXCHANGERS AND BURNER/RECUPERATOR ASSEMBLIES INCORPORATING SUCH CASINGS

Heinz Brune, P.O. Box 3201, Station C, Hamilton, Ontario, Canada (L8H 7K6)

Continuation-in-part of Ser. No. 10,186, Feb. 7, 1979, Pat. No. 4,262,740. This application Mar. 9, 1981, Ser. No. 241,896

Int. Cl.³ F28F *9/00*

U.S. Cl. 165—69 **8 Claims**



1. A casing for a heat exchanger core which has therein a first plurality of parallel passages extending between two opposite faces of the body and constituting a first fluid flow path having an inlet and an outlet and a second plurality of parallel passages extending between two other opposite faces of the body and constituting a second fluid flow path having an inlet and an outlet and in heat exchange communication with the first path, the casing including:

a hollow casing body having an internal shoulder to be engaged by a respective face of the core and surrounding a respective fluid path inlet or outlet from the casing body;

a first gasket interposed between the shoulder and the edges of the abutting core face;

a second gasket mounted on the edges of the core face opposite to the said abutting face to seal the join between the said core edges and the casing body;

a gasket compressor member engaging the gasket face of the second gasket opposite to that engaged with the core face edges; and

resilient means operative between the gasket compressor member and the casing body to urge the compressor member toward the core face and thereby compress the gaskets into sealing engagement with the respective core edges and the casing body;

wherein the said hollow casing body comprises a central portion thereof of a thickness to just accommodate a respective heat exchanger core;

a first end portion removably mounted on said central portion and providing a respective plenum for gases passing through the core;

and wherein the said gasket compressor member comprises a second end portion of the hollow casing body providing another respective plenum for gases passing through the core.

4,333,523

REFLUX CONDENSER

Harold E. Hartzler, Goshen, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Nov. 1, 1979, Ser. No. 90,323

Int. Cl.³ F28B *1/00*

U.S. Cl. 165—73 **9 Claims**

1. In combination with a reflux apparatus having a central chamber for the reception of hot gases from a reaction vessel, which central chamber is designed to be open to the atmosphere at one end and removably connected to and in gaseous communication with the reaction vessel at the other end and is surrounded by a cooling jacket for flow therethrough of a cooling liquid for cooling and condensing hot gases surging through the central chamber from the reaction vessel, the improvement wherein the central chamber comprises:

(a) a lower primary condenser formed of 2 or more bulbous portions connected to and in fluid communication with each other and with,

(b) an upper secondary condenser formed of a curvilinear column.

4,333,524

HIGH EFFICIENCY FURNACE

Robert H. Elkins, Hinsdale; Gary M. Durkin, Justice, and Robert A. Macriss, Deerfield, all of Ill., assignors to Southern California Gas Company, Los Angeles, Calif.

Continuation of Ser. No. 16,206, Feb. 28, 1979, Pat. No. 4,249,594. This application Feb. 9, 1981, Ser. No. 232,807

The portion of the term of this patent subsequent to Feb. 10, 1998, has been disclaimed.

Int. Cl.³ F28D *13/00*; F22B *23/06*; F28B *7/00*

U.S. Cl. 165—104.16 **39 Claims**

1. In a high efficiency furnace, multiple fluidized bed means for heat exchange between two gas streams comprising:

flue gas duct means for conveyance of flue gas from a burner;

a first quantity of solid particles capable of operation at flue gas temperatures of about 200° to about 1200° F. comprising a first fluidized bed within said flue gas duct means and providing automatic flue closure upon stoppage of combustion;

distributor means for supporting said first fluidized bed and for admitting flue gas thereto and distributing flue gas throughout said first fluidized bed;

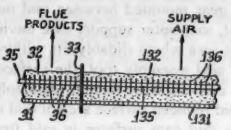
air duct means exterior to said flue gas duct means for the portion of its length passing through said first fluidized bed for conveyance of an air stream to be heated for introduction to heat an enclosed volume;

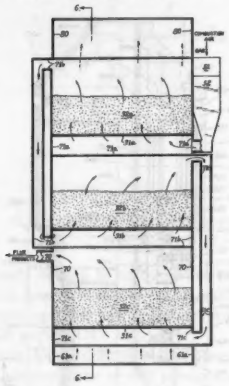
a second quantity of solid particles comprising a second fluidized bed within said air duct means;

distributor means for supporting said second fluidized bed

and for admitting air thereto and distributing the air to be heated throughout said second fluidized bed;

thermal exchange means in communication with said first





and second fluidized beds transferring heat from said first to said second fluidized bed;

each of said fluidized beds having a depth, when in fluidied state, of about ¼ inch to about 4 inches.

4,333,525

HEAT EXCHANGER FOR USE WITH HEAT PIPE

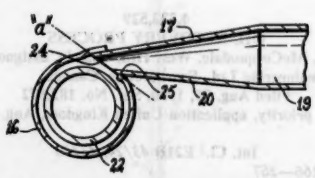
David D. Ikin, Blackburn; Paul G. Butler, Rosanna East; Christopher D. Sassella, Lower Plenty, and James K. Oliver, Altona North, all of Australia, assignors to Alcon of Australia Limited, Melbourne, Australia

Filed Oct. 4, 1979, Ser. No. 81,903

Claims priority, application Australia, Oct. 4, 1978, PD6226; Feb. 19, 1979, PD7737

Int. Cl.³ F28D *15/00, 7/10*

U.S. Cl. 165—104.21 **8 Claims**



1. A heat exchanger jacket adapted to surround portion of a fluid-containing pipe and having at least one end adapted for fluid tight connection to said pipe, said jacket including a substantially tubular body portion and two fluid conduits lying on opposite sides of the body portion, each said conduit being connected to the body portion adjacent an opposite end portion thereof and adapted for fluid tight connection to an opposed conduit in such a manner as to impart a turbulent swirling or helical path to fluid passing through said body portion, characterized in that the end of at least said fluid conduit adapted to carry incoming fluid is formed before connection of the conduit to said body portion as a nozzle of decreased cross-sectional flow area normal to the flow of said fluid, and said decreased cross-sectional flow area is not more than the cross-sectional area of the fluid flow passage in the annular chamber, formed in use between said body portion and said pipe, adjacent the nozzle and normal to the flow path in said chamber.

4,333,526

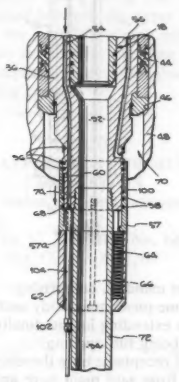
ANNULUS VALVE

Bruce J. Watkins, Rancho Palos Verdes, Calif., assignor to Hughes Tool Company, Houston, Tex.

Filed May 10, 1979, Ser. No. 37,841

Int. Cl.³ E21B *34/02*

U.S. Cl. 166—87 **6 Claims**



1. In an annulus valve apparatus for controlling fluid flow through a tubing-casing annulus formed between a casing and an inner tubing, said apparatus having a tubing hanger body landed within said casing in sealing relation thereto closing said annulus, said apparatus comprising:

passage means communicating between portions of said tubing-casing annulus above and below said tubing hanger body for passing fluid therebetween;

hydraulically-actuated means for opening said passage means to fluid flow therethrough; and

means for supplying hydraulic fluid to said opening means from a location remote therefrom, said fluid activating said opening means from a closed to an open position relative to said passage means, the improvement wherein said means for opening comprises:

a generally cylindrical sleeve member slidably movable on said body between positions opening and closing said passage means and having an internal hydraulic fluid receiving annular chamber formed between said sleeve member and said body; and

said means for supplying hydraulic fluid includes a tubing mandrel run from said remote location and removably inserted concentrically into said hanger body, said mandrel having at least one control fluid passage therein and said body having a second fluid passage opening to said chamber and communicating with said mandrel control fluid passage when said mandrel is inserted in said hanger body, for supplying said hydraulic fluid to slide said sleeve member to said open position.

4,333,527

SIDE POCKET MANDREL AND METHOD OF CONSTRUCTION

Robert S. Higgins, Lewisville, and David T. Merritt, Carrollton, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 86,723, Oct. 22, 1979, abandoned, which is a continuation-in-part of Ser. No. 77,184, Sep. 20, 1979, abandoned. This application May 12, 1980, Ser. No. 148,928

Int. Cl.[3] E21B *23/03*

U.S. Cl. 166—117.5 34 Claims

1. A side pocket mandrel, comprising:

a. an elongate one-piece main body section having

i. a main bore extending longitudinally therethrough, said main bore being full opening,

ii. a machined receptacle bore therein extending alongside and offset from said main bore and open at its upper end,

iii. lateral port means in said main body section communicating said receptacle bore with the exterior of said main body section,

iv. means providing fluid communication between said main bore and said receptacle bore below the upper end thereof, and

v. means for connecting the lower end of said main body section to a tubing string; and

b. an upper body section welded to said main body section by a circumferential weld, said upper body section providing

i. a main passage therethrough in alignment with the main bore of said main body section,

ii. an offset belly therein in alignment with said receptacle bore providing space for operating a kickover tool for inserting a flow control device in said receptacle, and

iii. means for connecting the upper end of said upper body section to a tubing string.

4,333,528

SEAL ASSEMBLY RELEASING TOOL

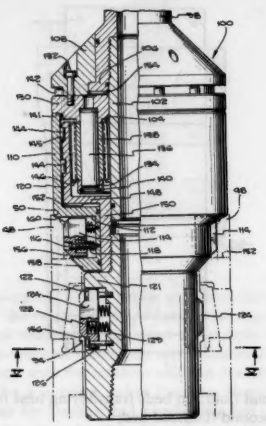
Daniel C. Woodman, Hermosa Beach, Calif., assignor to Hughes Tool Company, Houston, Tex.

Filed Oct. 2, 1980, Ser. No. 193,314

Int. Cl.[3] E21B *31/20*

U.S. Cl. 166—117.5 4 Claims

1. In a well formed with an outer well head casing and a concentric inner well head casing mounted upon a hanger which lands upon a shoulder formed on the inner surface of said outer well head casing having a casing hanger seal assembly mounted between said hanger and said outer casing an improved seal assembly releasing tool comprising: a shaft for lowering said tool into said outer casing of said well; an outer support case rotatably mounted upon said shaft; an inner unlocking element rotatably mounted within said outer support case; a planetary gear mounted between said outer case and said inner element; said outer support case having a reduced cylindrical surface area which slidably fits within a first cylindrical opening of said assembly tool, the surface of which is relieved to form cam surfaces therein; cam follower means extending from said reduced surface area of said outer support case for engaging said cam surfaces in said first cylindrical opening surface; said inner unlocking element having an extended cylindrical surface area which slidably fits within a second smaller concentric cylindrical opening of said assembly tool than said first mentioned cylindrical opening, the surface of which is relieved to form cam surfaces therein; and cam follower means extending from said extended surface area of said inner unlocking element for engaging said cam surfaces on said second cylindrical opening surface; wherein rotation of said tool turns and locks said first mentioned cam followers into said first seal assembly surface and continued rotation turns and locks said second mentioned cam followers into said second seal assembly surface in an opposite direction for releasing said seal assembly.



4,333,529

OIL RECOVERY PROCESS

Robert P. McCorquodale, West Hill, Canada, assignor to Wet-Com Engineering Ltd., Scarborough, Canada

Filed Aug. 29, 1980, Ser. No. 182,572

Claims priority, application United Kingdom, Aug. 31, 1979, 7930336

Int. Cl.[3] E21B *43/24, 43/40*

U.S. Cl. 166—267 7 Claims

1. A continuous process for the recovery of oil from an oil deposit, which comprises:

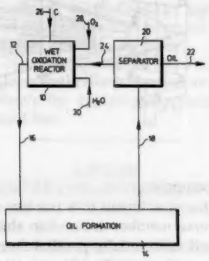
(a) continuously feeding an aqueous dispersion of carbonaceous material having a concentration of about 10 to about 20 wt.% COD to an enclosed reaction zone,

(b) continuously contacting said aqueous dispersion of carbonaceous material with an oxidizing gas in said enclosed reaction zone at a temperature of about 200° to about 350°, at a pressure of about 500 to about 3000 psi and for a time of about 5 to about 120 minutes to effect substantial wet oxidation combustion of said carbonaceous material to form a product gas stream having a pressure of about 500 to about 3000 psi and containing about 50 to about 95% by

volume of steam, about 5 to about 50% by volume of carbon dioxide and 0 to about 35% by weight of nitrogen,

(c) continuously injecting said product gas stream into said oil deposit under sufficient pressure to cause said oil to be ejected from said deposit in aqueous admixture,

(d) continuously recovering oil from said ejected aqueous admixture to leave an aqueous medium containing residual quantities of said oil in a concentration of about 1000 to about 10,000 ppm COD,



(e) continuously adding to said aqueous medium sufficient quantity of a fossil fuel to provide an aqueous dispersion of carbonaceous material having a concentration of about 10 to about 20 wt.% COD, and

(f) continuously forwarding said latter aqueous dispersion to said enclosed reaction zone as said continuously fed aqueous dispersion in step (a), whereby said residual quantities of said oil are consumed in forming said gas stream.

4,333,530

METHOD AND APPARATUS FOR CEMENTING A CASING

Ernest E. Armstrong, 3521 Seaboard, Midland, Tex. 79701

Continuation-in-part of Ser. No. 714,589, Aug. 16, 1976, Pat. No. 4,105,074, and a continuation-in-part of Ser. No. 814,396, Jul. 11, 1977, abandoned. This application Dec. 8, 1978, Ser. No. 967,791

Int. Cl.³ E21B *33/16*

U.S. Cl. 166—289 **19 Claims**

1. Method of cementing a casing in a borehole comprising:

(1) connecting an upper casing string and a lower casing string together with a coupling member while running the casing string into the borehole;

(2) forming an isolated flow path which extends through the entire casing string to the bottom of the borehole;

(3) flowing cement along said isolated flow path and back up the borehole annulus to cement the lower casing string within the lower borehole;

(4) perforating the lower casing string after the first cementing stage of step (3), testing the well to determine the production rate thereof, shutting in the well, and thereafter continuing with step (5);

(5) moving the upper casing string respective to the lower casing string, using the relative movement effected between the upper and lower casing strings to form a lateral flow path which extends through the upper casing string and directly from the coupling member into the borehole annulus;

(6) flowing cement through the upper casing string, down to the lateral flow path and directly into the borehole annulus at a location above the lower casing string, and forcing cement to flow up the borehole annulus towards the surface of the ground;

(7) moving the upper casing string and using the relative movement effected between the upper and lower casing strings to close the lateral flow path and to form a sealed flow passageway through the coupling member; and,

(8) leaving the coupling member downhole as a permanent part of the casing string.

4,333,531

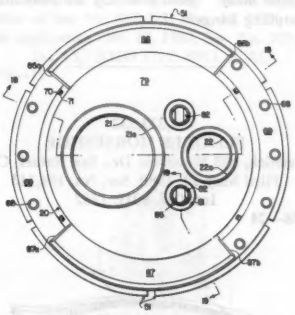
METHOD AND APPARATUS FOR MULTIPLE WELL COMPLETION

John E. Lawson, London, England, assignor to Armco Inc., Middletown, Ohio

Filed Feb. 11, 1980, Ser. No. 120,695

Int. Cl.³ E21B *41/04*

U.S. Cl. 166—341 **5 Claims**



1. In the completion of an underwater well by a procedure including running in a multiple string tubing hanger with the aid of a guidance system while the drilling upper body is in place, orienting the tubing hanger with respect to the drilling upper body, landing the tubing hanger below the drilling upper body while maintaining orientation of the tubing hanger, removing the drilling upper body, and then installing with the aid of the guidance system a production upper body having flow passages to be placed in respective communication with flow passages of the tubing hanger, the improved method for assuring precise orientation of the production upper body relative to the flow passages of the tubing hanger comprising

providing the upper end of the tubing hanger with a transverse flange interrupted by a gap having a predetermined angular relation to the positions of the through passages of the tubing hanger;

connecting to the tubing hanger a handling tool having both a locator device adapted to coact with orientation reference means on the drilling upper body and a dependent

spline dimensioned for snug insertion through the gap in the tubing hanger flange and having a predetermined angular relation to the locator device and a predetermined angular relation to the through passages of the tubing hanger when the spline of the handling tool extends through the gap in the hanger flange;

running in the handling tool and tubing hanger;

manipulating the handling tool to cause the locator device to coact with the orientation reference means of the drilling upper body;

manipulating the handling tool to land the oriented tubing hanger while maintaining orientation of the tubing hanger;

disconnecting the handling tool from the tubing hanger and retrieving the handling tool;

removing the drilling upper body;

providing the production upper body with a dependent spline dimensioned for snug insertion through the gap in the tubing hanger flange and having the same angular relation to the flow passages of the production upper body as the spline of the handling tool had with the flow passages of the tubing hanger when the handling tool was attached to the tubing hanger;

lowering the production upper body to the tubing hanger with the aid of the guidance system and employing the guidance system to maintain the production upper body in a rotational position such that the spline of the production upper body is substantially aligned with the gap in the tubing hanger flange; and

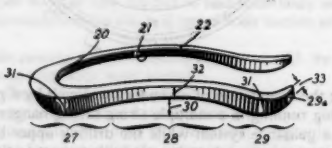
when the spline of the production upper body engages the tubing hanger flange, remotely adjusting the rotational position of the production upper body to eliminate any misalignment between the spline of the production upper body and the gap of the tubing hanger flange and landing the production upper body with the spline extending through the gap and with the flow passages of the production upper body aligned precisely with the flow passages of the tubing hanger.

4,333,532

FLEXIBLE HORSESHOE

Paul E. Mennick, 693 Woodbine Dr., San Rafael, Calif. 94903

Filed May 28, 1980, Ser. No. 154,113
Int. Cl.³ A01L *1/02*
U.S. Cl. 168—24 **8 Claims**



1. A horseshoe comprising:

a generally U-shaped body of a resilient, flexible material;

a pair of toe portions at the forward end of said body and formed by the body;

toe support surfaces on the undersides of said toe portions each providing an area of ground contact;

heel portions at the trailing ends of said body; and

heel support surfaces on the undersides of said heel portions providing areas of ground contact;

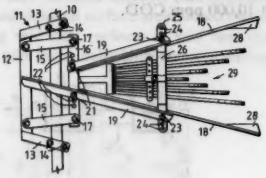
said shoe, when undeformed, having fore to aft arched portions in the legs of said U-shaped body generally centrally of each of said toe portions and one of said heel portions to enable flexing thereof.

4,333,533

WEEDER FOR ROW CROPS

Frank G. Zahra, and Johann V. Binder, both of Cardier Rd., Wangan, Australia (4860)

Filed Dec. 1, 1980, Ser. No. 211,853
Int. Cl.³ A01B *39/18*
U.S. Cl. 172—155 **5 Claims**



1. A weeder comprising:

a main frame for attachment to a tractor;

a fixed transverse member secured to the main frame forwardly of and substantially parallel thereto;

a movable transverse member rearwardly of and substantially parallel to the main frame;

two pairs of connecting links pivotally connecting the movable transverse member to the fixed transverse member, the links of each pair passing respectively above and below the main frame, the pairs of links being so arranged that the movable transverse member may move laterally, but with limited vertical movement, relative to the main frame; and

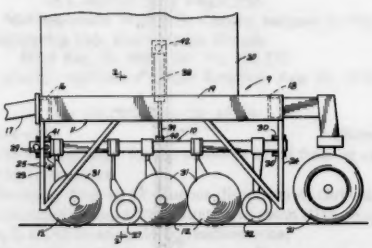
a pair of upright skid boards being laterally spaced at the front and rearwardly divergent and so constructed and arranged that, when the tractor-drawn main frame is advanced, the skid boards travel in a furrow and to both sides of the plants of a row crop, into which the soil may fall as the weeder passes, the skid boards being laterally movable relative to the main frame as they travel in the furrow.

4,333,534

AGRICULTURAL TOOL CARRIER

Guy J. Swanson, S. 4305 University, Spokane, Wash. 99206, and Morton C. Swanson, Rte. 1, Palouse, Wash. 99161

Filed Aug. 4, 1980, Ser. No. 174,841
Int. Cl.³ A01C *5/00*
U.S. Cl. 172—464 **4 Claims**



1. An agricultural tool carrier comprising:

a ground-supported frame;

front and rear upright guides fixed on said frame in longitudinally spaced positions along its intended direction of travel, said guides presenting upright surfaces;

a longitudinally elongated single row tool bar mounted between the front and rear guides, said tool bar being

aligned along the intended directions of travel of said frame;

first means operably connected between said tool bar and one of said guides for transmitting longitudinal forces from the frame to said tool bar by engagement of said upright surfaces during frame travel;

second means operably connected between said tool bar and each of said guides for vertically guiding the tool bar for elevational movement relative to the frame alongside each of said front and rear guides by engagement of said upright surfaces;

a first ground-engaging wheel mounted to the tool bar at a location adjacent to the front guide; and

a second ground-engaging wheel mounted to the tool bar at a location adjacent to the rear guide;

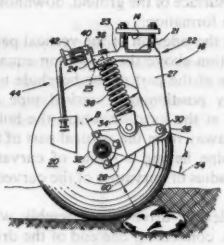
power means operably connected between the frame and tool bar at a location between the first and second ground-engaging wheels for applying a selected vertical force against the tool bar.

4,333,535

DISC STANDARD ASSEMBLY

Robert D. Hentrich, Sr., Walcott, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jul. 25, 1980, Ser. No. 172,363
Int. Cl.³ A01B *21/08*
U.S. Cl. 172—572 **15 Claims**



1. In a disc harrow with a frame, a disc gang and a support assembly for supporting the disc gang from the frame, the support assembly comprising:

a standard with an upper end fixed to the frame and depending therefrom to a lower end remote from the frame;

an arm with a first end and with a second end rotatably supporting the disc gang, the first and second arm ends having a horizontal separation which is larger than their vertical separation;

pivot means for pivotally interconnecting the lower standard end and the first arm end and for confining the arm to pivot about an axis which lies in a horizontal plane, the arm having a length chosen so that the pivot means and an axis of the disc gang have a separation which is not greater than a radius of a disc of the disc gang; and

resilient means connected between the arm and the upper end of the standard for resisting upward pivoting of the arm and disc gang.

4,333,536

PLOW SHANK AND DIGGING BLADE ATTACHED TO LOWER EXTREMITY THEREOF BY ADAPTOR

John W. Ryan, Yowie Bay, Australia, assignor to Agrowplow Pty. Limited, Yowie Bay, Australia

Continuation of Ser. No. 932,022, Aug. 8, 1978, abandoned. This application Dec. 29, 1980, Ser. No. 220,410
Claims priority, application Australia, Aug. 9, 1977, PD1154
Int. Cl.³ A01B *15/02*
U.S. Cl. 172—721 **10 Claims**

1. Plowing apparatus comprising, in combination, an elongated plow shank which, in use, extends generally vertically and a plow digging point removably attached to the lower extremity of said shank so as to be drawn through soil thereby to cultivate the soil, said digging point including a digging blade and an adaptor, said blade having an upper earth working surface arcuate in transverse cross section so as to be generally convexed with downwardly sloping sides, said adaptor engaging said blade to releasably secure said blade to said shank and having a forwardly tapering recess which receives

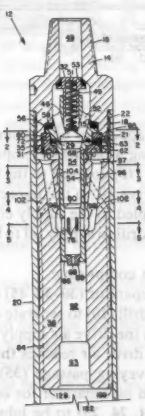
and generally encompasses said lower extremity of said shank, said adaptor and said blade having cooperating means for releasably securing said adaptor to said upper earth working surface of said blade, said adaptor and said cooperating means being configured so that said upper earth working surface is rearwardly upwardly inclined by from 5° to 15° with respect to the horizontal, said blade being located below said lower extremity of said shank to thereby enable said blade to present a low forward facing rounded profile.

4,333,537

IMPACT DRILLING TOOL HAVING IMPROVED VALVING

Jesse W. Harris, 527 Sonnet Dr., San Antonio, Tex. 78216, and Louis L. Lutich, 107 E. Turbo, San Antonia, Tex. 78216

Continuation of Ser. No. 963,221, Nov. 24, 1978, abandoned. This application Oct. 28, 1980, Ser. No. 201,579
Int. Cl.³ B25D *9/12*; F01L *21/02*
U.S. Cl. 173—17 **4 Claims**



1. An impact drilling tool for connection in a string of drilling pipe, said tool comprising:

an upper sub for connection to said drilling pipe;

a casing with an upper end connected to said upper sub;

anvil means slideably received in a lower end of said casing, said anvil means being connected to bit means;

hammer means carried in said casing above said anvil means,

said hammer means reciprocating along an elongated axis of said tool for striking said anvil means during each cycle;

means for feeding pressurized pneumatic fluid from said drilling pipe through a center portion of said hammer means, said feeder means having a lengthwise passage and a set of radial passages, a lower end of said feeder means terminating within said center portion of said hammer means;

cross passages in said hammer means with a first set terminating at an upper end above said hammer means and a second set terminating at a lower end below said hammer means, a lower end of said first set of cross passages terminating in said center portion below an upper end of said second set of cross passages which also terminate in said center portion;

said set of radial passages slideably connecting with said lower end of said first set of cross passages and said upper end of said second set of cross passages to respectively pressurize above and below said hammer means during each cycle thereof, said lower end of said feeder means slideably connecting with said lower end of said first set of cross passages to exhaust pressure above said hammer means during each cycle thereof;

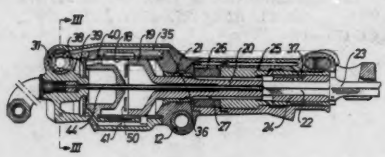
exhaust means carried by said anvil means and located between said hammer means and said anvil means for exhausting pressure below said hammer means during each cycle thereof.

4,333,538

PNEUMATIC DRILL LUBRICATOR

Carl G. B. Ekwall, Saltsjöbaden, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Oct. 1, 1979, Ser. No. 80,673
Claims priority, application Sweden, Oct. 6, 1978, 7810468
Int. Cl.³ B25D *17/26*
U.S. Cl. 173—104 **14 Claims**



1. Rock drilling apparatus comprising:

a rock drill having a pneumatic impact motor (10),

a supply conduit (15) coupled to the rock drill for supplying compressed drive air to the impact motor, and

an oiler (16) coupled to the supply conduit (15) at a distance from the rock drill to supply oil to the air in said air supply conduit (15),

the improvement comprising:

a wall flow oil separator (30–33; 45) arranged in connection with the rock drill (10) to separate oil from the oil containing drive air in the drive air supply conduit (15) before the oil containing drive air reaches the impact motor, and

at least one conveying passage (35) in said rock drill and coupled to said oil separator for conveying the separated oil to parts (21, 24, 25) to be lubricated within the rock drill,

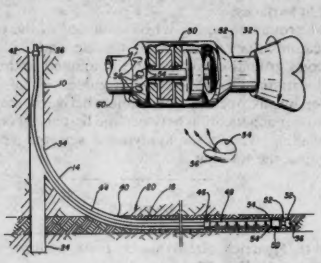
said wall flow oil separator including a passage for receiving the oil containing drive air and a transverse slot (32, 46) in a wall of said passage of the oil separator, said transverse slot being coupled to said at least one conveying passage (35) to supply the separated oil to said at least one conveying passage.

4,333,539

METHOD FOR EXTENDED STRAIGHT LINE DRILLING FROM A CURVED BOREHOLE

William C. Lyons, 1209 Calle Luna, Santa Fe, N. Mex. 87501, and Albert O. White, 1327 Fox Hollow Rd., Schenectady, N.Y. 12309

Filed Dec. 31, 1979, Ser. No. 108,686
Int. Cl.³ E21B *4/02, 7/08*
U.S. Cl. 175—61 **4 Claims**



1. Method of communicating a subterranean formation with the surface of the ground comprising the steps of:

forming a substantially vertical borehole which extends from the surface of the ground, downhole to close proximity of the formation;

penetrating the sidewall of the vertical part of the borehole at a location above the formation equal to the radius of curvature of the part of the borehole to be subsequently turned by positioning a curved pipe downhole in the borehole at the location where the hole is to be turned laterally away from the vertical part of the borehole; said curved pipe having a radius of curvature equal to the desired radius of curvature of the curved part of the borehole;

placing a flexible drive pipe assembly within said curved pipe; and, connecting one end of the drive pipe assembly to a drill pipe string;

attaching a drill bit to a gas turbine and connecting the gas inlet of the turbine to said flexible drive pipe assembly;

providing a resisting action for overcoming the turning reaction of the drill bit as cuttings are removed while penetrating the earth and forming the curved part of the borehole; directing the exhaust gases from said gas turbine away therefrom in a direction to provide at least part of said resisting action;

forcing said bit into engagement with the formation by moving the bit axially in advance of said turbine; and,

extending the borehole laterally away from the curved part of the borehole, so that the formation is penetrated substantially horizontally.

4,333,540

CUTTER ELEMENT AND CUTTER FOR ROCK DRILLING

William H. Daniels, Delaware, Ohio, and John B. Cheatham, Jr., Houston, Tex., assignors to General Electric Company, Worthington, Ohio

Continuation of Ser. No. 947,865, Oct. 2, 1978, abandoned. This application Feb. 11, 1980, Ser. No. 120,021
Int. Cl.³ E21B *10/46*
U.S. Cl. 175—329 **2 Claims**

1. An improved drag type oil and rock drill bit having composite compact cutter elements each comprising a polycrystalline layer of diamond cubic boron nitride, wurtzite boron nitride or mixtures thereof bonded to a substrate made of a cemented carbide selected from tantalum, titanium or tungsten carbide, wherein the improvement comprises compact cutting elements having a generally V-shape configuration in which

the polycrystalline diamond layer forms the legs of said V-shape, said V-shape defining an included angle of from

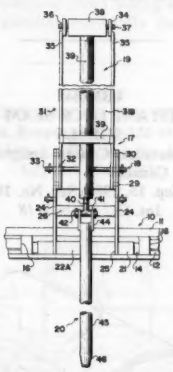
60°–90°, to cause a plowing effect and rock chip flow along the cutter elements.

4,333,541

BUMPER MOUNTED SOIL SAMPLING DEVICE

John G. Doty, Box 202, Carlyle, Saskatchewan, Canada

Filed Jun. 26, 1980, Ser. No. 163,102
Claims priority, application Canada, Nov. 1, 1979, 338946
Int. Cl.³ E21B *7/02, 10/02*
U.S. Cl. 175—162 **11 Claims**



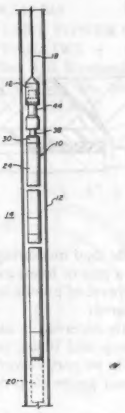
5. A soil sampling device for use with a truck or the like having a recess formed in the moulded rear bumper thereof; comprising in combination an hydraulic piston and cylinder assembly including a piston rod secured to and extending from the piston of said piston and cylinder assembly, frame means supporting the cylinder of said piston and cylinder assembly, a soil sampling tube detachably secured to the distal end of the piston rod of said piston and cylinder assembly and means for detachably mounting said sampling device within the recess of the moulded rear bumper of the associated truck, said means for detachably mounting said soil sampling device within the recess of the moulded rear bumper of the associated truck including a transverse channel member detachably secured within the recess, said frame means supporting said piston and cylinder assembly being secured to and extending upwardly from said transverse channel member and brace means extending between said frame means and said transverse channel.

4,333,542

DOWNHOLE FISHING JAR MECHANISM

William T. Taylor, P.O. Box 309, Warren, Tex. 77664

Filed Jan. 31, 1980, Ser. No. 117,308
Int. Cl.³ E21B *4/06*
U.S. Cl. 175—299 **27 Claims**



1. A downhole jar mechanism for freeing stuck objects within a well bore, said jar mechanism comprising:

a body structure including an anvil structure adapted for disposition in force transmitting relation with downhole fishing apparatus that establishes interconnection with an object stuck within said well bore;

an operator element receivable in movable relationship within said body structure including striker means axially immovably connected thereto adapted to strike said anvil and impart an upwardly directed impact force thereto;

compression spring means adapted to oppose movement of said striker means toward said anvil means; and,

means for releasing said striker means from the opposing force of said compression spring upon predetermined upward movement of said striker means toward said anvil structure, thereby controlling the force of impact of said striker means against said anvil structure, said releasing means including;

first detent recess means being defined internally of said body structure,

latch means disposed between said body structure and said operator element, said latch means being formed to define detent aperture means,

said operator element being formed to define second detent recess means,

detent means maintained within said detent aperture means and said second detent recess means by said body structure and interlocking said latch means and said operator element in said releasable interconnection, and

spring-energizing means being interposed between said latch means and said compression spring means and transmitting upward movement of said latch means to said spring means for compression of said spring means.

4,333,543

WHEEL OR AXLE LOAD MEASURING DEVICE FOR ROAD VEHICLES

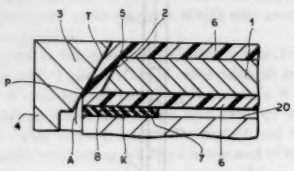
Ludwig Pietzsch, Rittnerstr. 36, 7500 Karlsruhe, Fed. Rep. of Germany; Knut Overlach, Karlsruhe, and Hans J. Eberhard, Rheinstetten, both of Fed. Rep. of Germany, assignors to Ludwig Pietzsch, Karlsruhe, Fed. Rep. of Germany

Filed Apr. 10, 1980, Ser. No. 135,534

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1979, 2914600; Apr. 11, 1979, 7910586[U]

Int. Cl.³ G01G *19/02*

U.S. Cl. 177—134 14 Claims



1. A road or axle load measuring device comprising:
- a frame having a pair of limbs extending transversely to the direction of travel of a vehicle whose axle or wheel load is to be measured;
- a measuring plate received in said frame and having edges extending along said limbs, said edges diverging downwardly so as to be partly overhung by said limbs;
- at least one strain gauge strip mounted on said measuring plate; and
- a pair of elastic bars formed on the underside of said measuring plate along said edges for supporting said measuring plate upon a surface whereby said measuring plate deformes between said bars when loaded by a wheel.

4,333,544

MUFFLER FOR COMBUSTION ENGINES

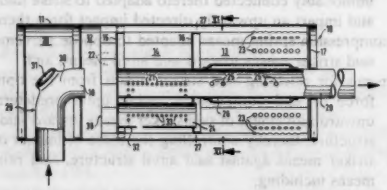
Walter Seeger, Gaggenau, Fed. Rep. of Germany, assignor to Max Roth KG, Gaggenau, Fed. Rep. of Germany

Filed Mar. 3, 1980, Ser. No. 126,318

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1979, 2908506

Int. Cl.³ F01N *1/08*

U.S. Cl. 181—266 8 Claims



1. Muffler for muffling high frequency portion of noise in combustion engines, comprising a housing subdivided by bottoms into at least two successively arranged reflection chambers, one of said chambers being a first inlet-side reflection chamber with an extending exhaust entry pipe, intermediate channel means extending through at least one inner bottom from a first into at least one reflection chamber, an exhaust outlet pipe extending from the last reflection chamber out of the muffler and having at least in the region of the last reflection chamber at least one inlet opening, said intermediate channel means having a plurality of intermediate channels which are flowed-through in one and the same direction, each channel having a small cross-sectional area in relation to the cross-section of the exhaust inlet pipe, said reflection chambers comprising a first outer reflection, a second outer reflection and a final reflection chamber, said intermediate channels passing outside the final reflection chamber located between the intermediate channels from the first outer reflection chamber into the second outer reflection chamber, exhaust passing into said final reflection chamber only after having left said second reflection chamber, the exhaust passing from said final reflection chamber into said exhaust outlet pipe, said intermediate channels being formed on the inner side of the wall housing; a sheet metal formed under a predetermined angle with corrugations at the inner side of the wall and forming together with the inner side of the wall said intermediate channels; said intermediate channels having a plurality of holes over a part of their length in the second outer reflection chamber which is adjacent the outlet bottom; an inner bottom next adjacent an outer bottom and having at least one passage hole; a resonator pipe closed at an end and connected to said passage hole, said resonator having holes in its wall; said exhaust outlet pipe being closed at its end associated with the muffler and extending from the last reflection chamber through an outlet bottom, a resonator space being located ahead of the first outer reflection chamber, and an exhaust inlet pipe arranged in said resonator space and constructed as a suction resonator, said suction resonator comprising a knee-shaped pipe, an opening being arranged in the region of the outer bend of the knee, said outlet opening being substantially in registry with the exhaust outlet pipe, the sum of the small cross-sectional areas of said channels being larger than the cross-sectional areas of said exhaust entry pipe, a predetermined number of said intermediate channels having tuning openings axially offset in different intermediate channels for different frequencies, said housing having a substantially oval cross-section, said exhaust entry pipe and said exhaust outlet pipe being arranged symmetrically in said housing, said intermediate channels being defined by tubes formed from corrugated sheet metal.

4,333,545

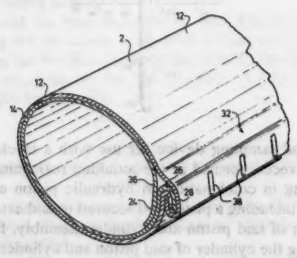
BACK-FIRE RESISTANT LOCK SEAM FOR MUFFLER SHELLS

Peter Roberts, Mississauga, Canada, assignor to Thrush Incorporated, Rexdale, Canada

Filed Sep. 15, 1980, Ser. No. 187,263

Int. Cl.³ F01N *7/18*

U.S. Cl. 181—282 11 Claims



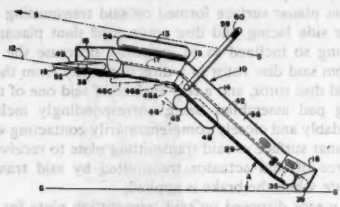
1. A muffler shell comprising:
- a two ply sheet of metal formed into a tube,
- an interlock joining the ends of the sheet to retain it in tubular formation, said interlock comprising complementary hook elements located at said ends, a hook element at one said end including both plies therein, the hook element at the other said end including the outer ply only, the inner ply at the other said end extending beyond the hook element to overlap said interlock thereby forming a shield therefor.

4,333,546

ESCAPE SLIDE

John M. Fisher, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 19, 1980, Ser. No. 122,216
Int. Cl.³ A62B *1/20*; B64D *25/14*
U.S. Cl. 182—48 8 Claims



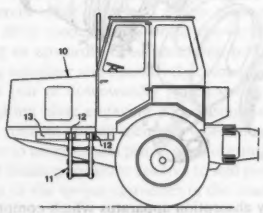
1. An escape slide adapted to be inflated and extend from a supporting surface at an elevated position to a lower surface comprising an inflatable entrance portion with a walkway for mounting on said supporting surface and a slide portion extending from an entrance end at said elevated position to an exit end at said lower surface, said entrance portion of said escape slide including a plurality of supporting tubes having top and bottom surfaces, at least some of said bottom surfaces of said supporting tubes being in the same plane for engagement with said supporting surface, at least some of said top surfaces of said supporting tubes providing support for said walkway and all of said supporting tubes being located above said plane of said bottom surfaces and below said walkway to provide a stable support for persons traversing said walkway to said entrance end of said slide portion, and an inflatable, substantially rigid walkway ramp having an upper surface and a lower surface extending outwardly from an edge of said entrance portion.

4,333,547

CLIMBING DEVICE FOR VEHICLES

Gustav I. Johansson, Korpvägen 9, S-826 00 Söderhamn, Sweden

Filed Apr. 1, 1980, Ser. No. 136,253
Int. Cl.³ E06C *5/26*
U.S. Cl. 182—90 8 Claims



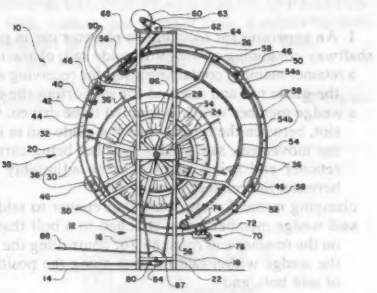
1. A climbing device for vehicles, said climbing device comprising a number of foot steps arranged on a frame composed of one or more supporting members, said supporting members being made of flexible material to allow temporary deformation of said frame without causing permanent damages in said frame when striking an obstacle, said device having means at one end thereof for attachment to the vehicle in cantilever relation with the other end of said device being adapted to terminate freely spaced from the vehicle in outwardly displaced relation, said flexible supporting members including a reinforcement located in the vicinity of that face of said members which is directed outwardly from the vehicle in order to provide said members with a greater resistance to bending in the direction inwardly toward the vehicle than in the opposite direction.

4,333,548

WEIGHT DRIVEN ROTARY POWER GENERATING APPARATUS

Sterling W. Jones, Rte. 1, Box 118, Rowland, N.C. 28383

Filed May 2, 1980, Ser. No. 146,353
Int. Cl.³ F03G *3/02*
U.S. Cl. 185—33 10 Claims

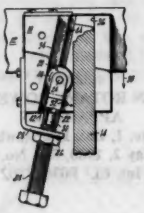


1. A weight actuated power generating apparatus adapted to utilize the energy associated with a plurality of moving weights to drive a flywheel comprising: a frame structure; a flywheel rotatively mounted to said frame structure; a weight guide assembly radially spaced from said flywheel and continually extending therearound in a closed fashion, said weight guide assembly including two axially spaced tracks with each track including two radially spaced retaining members that define an open raceway therebetween; a plurality of weights movably mounted in said weight guide assembly with said weights including opposed bearing means adapted to be retained within said open raceway for allowing said weights to move around said weight guide assembly, and wherein said weight guide assembly includes a falling run through which said weights fall, and a return run through which said weights are returned to an elevated position; means projecting from said flywheel for engagement with respective weights moving through said falling run for enabling said weights to impart a driving force to said flywheel as the respective weights move through said falling run segment of said weight guide assembly; and weight transfer means operatively associated with said apparatus for engaging respective weights after passing through said falling run and for transferring said weights through said return run to an elevated position where the respective weights assume potential energy due to their evaluation within said weight guide assembly, whereby as the weights are allowed to move through said weight guide assembly, respective weights engage the means projecting from said flywheel during the period in which the respective weights are moving through said falling run, wherein engagement of the weights with the flywheel imparts a driving force thereto and generally acts to contribute to the driving force of said flywheel; and output means drivingly interconnected to said flywheel for generating an output torque in response to said flywheel being driven.

4,333,549
CAR BLOCKING APPARATUS

Meredith R. Davis, Bristol, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Jun. 25, 1980, Ser. No. 162,870
Int. Cl.³ B66B 5/16
U.S. Cl. 187—93 3 Claims

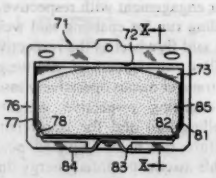


1. An apparatus for blocking an elevator car in position in a shaftway containing an elevator guide rail, characterized by:
a retainer member containing a slot for receiving a portion of the guide rail and adapted for supporting the car,
a wedge member which is adapted to be driven, within said slot, between the retainer and the guide rail in response to car movement, said wedge member being carried on the retainer and being adapted to be adjustably positioned between the retainer and the rail,
clamping means for attaching the retainer to said rail,
said wedge member being attached to a bolt that is carried on the retainer and rotatable for controlling the position of the wedge within said retainer along the positioning axis of said bolt, and
said wedge member comprising a roller, a yoke, a first pin and a second pin, said roller being mounted on said first pin to rotate thereon, said first pin being mounted to said yoke, said yoke being mounted on said second pin to rotate around the axis of said second pin, said second pin being attached to said bolt with said axis oriented to permit said yoke to rotate around the positioning axis of said bolt.

4,333,550
BRAKE SHOE AND SUPPORT STRUCTURE FOR A DISC BRAKE

Kenji Shirai, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed May 20, 1980, Ser. No. 151,640
Claims priority, application Japan, Feb. 4, 1980, 55-12234
Int. Cl.³ F16D 55/15
U.S. Cl. 188—72.2 6 Claims

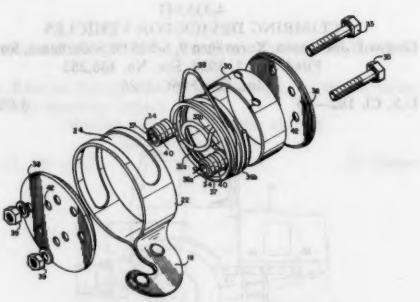


1. A disc brake comprising:
a disc rotor having on either side thereof a friction surface;
a pair of braking pad assemblies respectively consisting of a friction pad disposed face to face with said friction surface and a backing plate secured to the rear side of said friction pad;
an actuator disposed face to face with said backing plate for urging said braking pad assemblies onto said friction surfaces of said disc rotor by corresponding urging surfaces formed thereon parallel to said friction surfaces;
a transmitting plate sandwiched at least between one of said braking pad assemblies and said actuator for transmitting the urging force of said actuator to said one of the braking pad assemblies;
a stationary member supporting said transmitting plate movably in a parallel direction to the axis of said disc rotor;
a slant planar surface formed on said transmitting plate on the side facing said disc rotor, said slant planar surface being so inclined as to gradually decrease the distance from said disc rotor in a direction away from the axis of said disc rotor, and a rear surface of said one of the braking pad assemblies being correspondingly inclined for slidably and closely complementarily contacting said slant planar surface of said transmitting plate to receive urging force of said actuator transmitted by said transmitting plate when the brake is applied;
cam means disposed on said transmitting plate for pushing said one of the braking pad assemblies in a direction away from the axis of said disc rotor, when said one of the braking pad assemblies is laterally moved together with said disc rotor by frictional force produced between the two;
stopper means for limiting the movement amount of said one of the braking pad assemblies in the rotational direction of said disc rotor; and
return spring means for restoring said one of the braking pad assemblies to the original position when the brake is released.

4,333,551
LOAD LIMITER

Joseph Shefrin, Springfield, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 28, 1979, Ser. No. 79,934
Int. Cl.³ F16F 7/12
U.S. Cl. 188—372 10 Claims



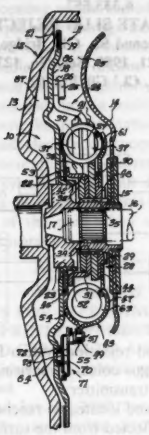
1. An energy absorption apparatus which comprises:
a housing;
an energy absorption means which includes a single length of wire forming a first loop, a second loop, and a third loop, said third loop being interposed between said first and second loops, said wire continuing to form a first coil from said first loop and a second coil from said second loop, said first and second loops being positioned within the circumference of said first and second coils, and said third loop being positioned outside the circumference of said third loop; and
a pair of spaced guide means projecting through said first and second loops and connected to said housing whereby energy is absorbed by bending said wire about said guide means in the event a predetermined force is exerted between said third loop and said housing.

4,333,552

HYDRAULIC PRESSURE RELIEF VALVE

Paul E. LaMarche, Utica, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed May 27, 1980, Ser. No. 153,130
Int. Cl.[3] F16D 47/06
U.S. Cl. 192—3.29 17 Claims



1. In a lock-up clutch assembly for a torque converter having a vibration damper therein, the assembly including a piston plate adapted to engage the housing of the torque converter, a hub assembly operatively connected to the hub of the torque converter turbine and having a pair of oppositely disposed radially extending hub arms, a floating equalizer journalled on said hub assembly and having spring separators mounted therein, a plurality of compression springs positioned between said spring separators and hub arms, and drive means secured to said piston plate and extending into the path of said compression springs, the improvement comprising pressure relief valve to equalize the pressure on the opposite sides of the piston plate, said piston plate having at least one opening therein, a resilient sealing member encompassing said opening, and said relief valve including a sliding valve plate having an opening therein offset from said piston plate opening in the neutral and drive modes of the torque converter, and a spring plate having an upwardly offset mounting portion secured to said floating equalizer and operatively connected to said valve plate, and a pair of downwardly biased spring arms integral with said spring plate engaging and biasing said valve plate against said resilient sealing member, wherein actuation of the valve occurs to uncover said piston plate opening due to movement of said floating equalizer relative to said piston plate upon deceleration of the torque converter in the coast mode.

4,333,553

PRESTRESSED ELASTOMER FOR ENERGY STORAGE

Lyle O. Hoppie, Birmingham, and Donald Speranza, Canton, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

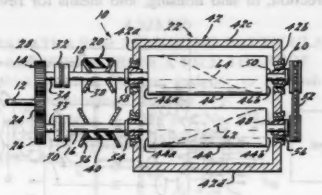
Filed Sep. 8, 1980, Ser. No. 184,880
Int. Cl.[3] F16D 67/02; B60K 41/24
U.S. Cl. 192—4 A 17 Claims

1. An energy storage device comprising:

a shaft means mounted for rotation;

an elastomeric rod having a longitudinal axis and first and second ends lying along the axis;

means mounting said rod for rotation of said first end relative to said second end in response to rotation of said shaft means, thereby torsionally stressing the rod about said axis; and



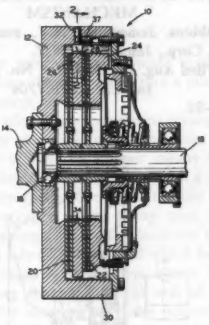
means prestressing the rod in the direction of the longitudinal axis independent of said torsional stressing.

4,333,554

SELF-ALIGNING CLUTCH PLATE DRIVE APPARATUS

William H. Sink, Auburn, and Wendell Lane, Kendallville, both of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Mar. 6, 1980, Ser. No. 127,718
Int. Cl.[3] F16D 13/50, 3/06
U.S. Cl. 192—70.19 12 Claims



1. In a clutch having a driven plate axially movable but rotatably fixed with respect to the flywheel, said flywheel comprising a drive pin and means for holding said drive pin; an improvement for driving said driven plate wherein said drive pin comprises a shank fixedly connected to and extending radially inwardly of said holding means, said shank containing a drive head rotatably mounted thereto in driving engagement with said driven plate.

4,333,555

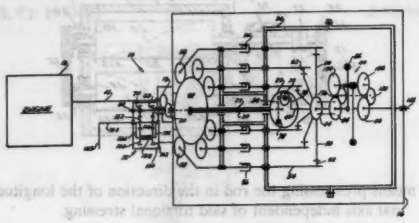
VARIABLE SPEED TRANSMISSION

Laird B. Gogins, Salt Lake City, Utah, assignor to Power-Matic Corporation, Salt Lake City, Utah

Division of Ser. No. 945,123, Sep. 25, 1978, Pat. No. 4,194,407.
This application Mar. 24, 1980, Ser. No. 133,416
Int. Cl.[3] F16D 31/00
U.S. Cl. 192—58 R 3 Claims

1. A clutch comprising a housing having a non-circular chamber formed therein; a shaft rotatably mounted in said housing and extending through said chamber, a rotor body secured to said shaft in said chamber for rotation therein, said rotor body having a plurality of radially extending slots formed therein; means in said body for providing fluid communication between the lower ends of said slots and the portion of the chamber surrounding the rotor; a plurality of radially extending vanes respectively slidably mounted in said slots for radial movement with respect to said rotor; said vanes dividing said chamber into a plurality of spaces between the vanes about the rotor; hydraulic fluid in said spaces and slots below the

vanes whereby said shaft will drive said housing through said fluid when the shaft is rotated faster than the rotation, in the same direction, of said housing, and means for reversing the



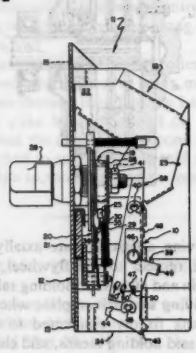
driving direction of the clutch including means for selectively permitting fluid to pass from some of said spaces to the bottom of said slots.

4,333,556

DEVICE FOR VARYING NUMBER OF COINS NEEDED TO PERMIT OPERATION OF A COIN-OPERATED MECHANISM

James M. Robbins, Jamestown, N.Y., assignor to Jamestown Metal Mfg. Corp., Jamestown, N.Y.

Filed Aug. 18, 1980, Ser. No. 178,777
Int. Cl.³ G07F *1/04*
U.S. Cl. 194—92 **17 Claims**



1. In a coin-operated mechanism having a coin chute, an actuator by which said mechanism may be selectively operated, and a coin-feeling finger arranged to permit operation of said actuator when a coin is sensed as being in a predetermined position within said chute, the improvement comprising: a selector for varying the number of coins needed to permit said actuator to be operated, said selector mechanism including

an arm mounted for movement relative to said chute, said arm having one portion engageable with said actuator;

a first stop mounted on said arm and selectively movable relative thereto between an operable position arranged to hold a coin within said chute in a first position to be sensed by said finger, and an inoperable position which will permit a coin to pass;

a second stop mounted on said arm and selectively movable relative thereto between an operable position arranged to hold a coin within said chute in a second position beneath said first position, and an inoperable position which will permit a coin to pass; and

a third stop mounted on said arm and arranged for movement therewith between an operable position at which a coin within said chute will be held in a third position beneath said second position, and an inoperable position which will permit a coin to pass;

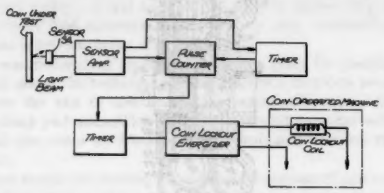
whereby said first and second stops may be selectively moved relative to said arm to vary the number of coins needed to permit said actuator to be operated.

4,333,557

SOLID STATE SLUG REJECTOR

George M. Kozak, 58 Second St., Old Bridge, N.J. 08857

Filed Feb. 21, 1980, Ser. No. 123,385
Int. Cl.³ G07F *3/02*
U.S. Cl. 194—97 A **3 Claims**



1. A slug detection and rejection system for distinguishing between genuine and bogus coins, comprising:

a. an electromagnetic transmitter;

b. a receiver adapted and located to receive pulsed electromagnetic energy reflected from the surface contours of a face of a moving coin; and

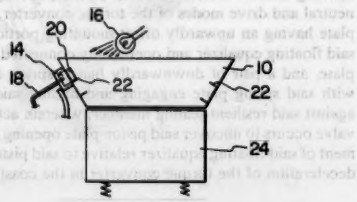
c. pulse-counting electrical circuit means, said pulse counting electrical circuit means distinguishing between a genuine and a bogus coin by counting the number of received pulses, comparing said number with a pre-selected number and activating a coin lock-out mechanism accordingly.

4,333,558

PHOTOELECTRIC CONTROL SYSTEM FOR PARTS ORIENTATION

Takeyoshi Nonaka, and Kazuo Otsuka, both of Hino, Japan, assignors to Shinko Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 683,938, May 6, 1976, abandoned. This application Oct. 27, 1977, Ser. No. 846,103
Int. Cl.³ B65G *47/24*
U.S. Cl. 198—391 **16 Claims**



1. A photo-electric control system for controlling the orientation of parts moving along a parts feeding track of a vibratory bowl-type parts feeder, said control system comprising:

plural photo-responsive elements mounted adjacent the parts feeding track in a selected parts detection position and adpated to respond to light directed across the path followed by the parts;

at least one other photo-responsive element mounted adjacent the parts feeding track at the detection position and also adapted to respond to light directed across the path;

a light source for projecting light across the path to said photo-responsive elements;

spacing means for spacing apart parts successively arriving at said detection position;

said first-mentioned photo-responsive elements adapted to produce multiple-state discrimination signals, each discrimination signal indicative of a part orientation;

said second-mentioned photo-responsive element adapted to produce an synchronizing signal when a part interrupts the light to said second-mentioned photo-responsive element;

electronic processing means including a synchronously operable, multiple state storage means adapted to store said discrimination signal or a combination thereof;

pre-programmable switch means connected between said first-mentioned photo-responsive elements and said processing means and having multiple switching configurations to present the discrimination signal or a combination thereof to said electronic processing means;

said second-mentioned photo-responsive elements connected to a synchronous input of said storage means;

said processing means providing a signal indication as to the orientation of the part when said synchronizing signal enables said storage device.

4,333,559

APPARATUS FOR INFEEDING FLAT PRODUCTS, ESPECIALLY PRINTED PRODUCTS, ARRIVING IN AN IMBRICATED STREAM TO A TRANSPORT DEVICE

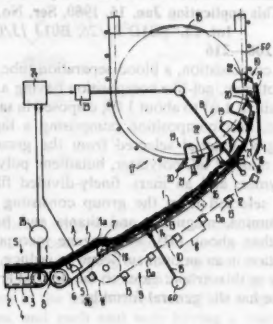
Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Jan. 10, 1980, Ser. No. 110,822

Claims priority, application Switzerland, Jan. 29, 1979, 843/79

Int. Cl.³ B65H *29/04*

U.S. Cl. 198—461 **9 Claims**



1. An apparatus for infeeding substantially flat products, especially printed products, arriving in an imbricated products stream, to a transport device, comprising:

a transport device having gripper elements arranged behind one another with respect to a direction of conveying of the products;

said gripper elements serving for engaging the infed products;

a conveyor device provided with a number of substantially equidistantly spaced entrainment members for engaging trailing edges of the products;

means for revolvingly driving said conveyor device at a greater velocity in relation to the infeed velocity of the imbricated stream of products;

the spacing between each two neighboring entrainment members being greater than the spacing between the trailing edges of two printed products which bear upon one another;

means for engaging individual ones of said products in the product stream conveyed by said conveyor device; and

said engaging means reducing the speed of conveying of the momentarily engaged product in relation to the conveying speed of a given number of trailing products until engagement by one of the entrainment members.

4,333,560

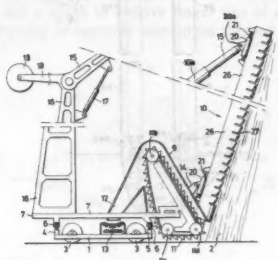
APPARATUS FOR REMOVING PARTICULATE MATERIAL FROM A PILE THEREOF

Olof E. Frisk, Järved, Sweden, assignor to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed Aug. 1, 1980, Ser. No. 174,384

Int. Cl.³ B65G *65/02*

U.S. Cl. 198—519 **9 Claims**



1. Apparatus for removing particulate material having a volume not exceeding about 0.5 dm^3 from a pile thereof, comprising, in combination,

(1) an elongated tubular scraper means arranged for oscillatory movement along its longitudinal axis;

(2) a base upon which the scraper means is carried in a manner to be brought into contact with a side of the pile of material from the bottom up to the top of the pile;

(3) the tubular scraper means being open at the bottom thereof, and having a side wall which can be brought into contact with a side of the pile, and which has a plurality of slots therethrough arranged one above the other and extending along the longitudinal axis of said tube, the lower edge of at least one such slot projecting outwardly from the outer wall of the tube further than the upper edge of such slot; and

(4) the tubular scraper means when oscillating scraping material from the pile through the slots into and through the tube down to the ground, so that said material can be collected and carried away from said pile.

4,333,561

ELEVATOR HEAD MATERIAL GUIDE MEANS

Hans J. Schlegel, 6129-72nd La. North, Minneapolis, Minn. 55429

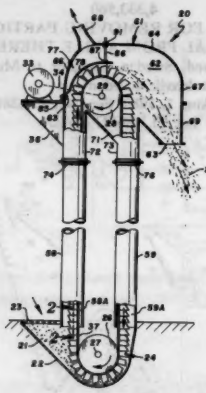
Continuation of Ser. No. 923,181, Jul. 10, 1978, abandoned. This application Aug. 8, 1980, Ser. No. 176,480

Int. Cl.³ B65G *17/36, 35/00*

U.S. Cl. 198—703 **15 Claims**

7. In a conveyor for moving material including endless moving belt means having a plurality of cooperatively associated cups thereon for receiving and carrying material as said endless belt moves in a substantially linear path beween spaced pulleys and discharging material as said cups pass around one of said pulleys, a housing generally enclosing said endless belt means, said housing having an outer wall adjacent the material discharge end of the conveyor, and a arcuate baffle to aid in retaining material in said cups as the latter pass around said one pulley prior to material discharge, said baffle having a configuration substantially complementary to the arcuate path of said cups about said one pulley and having an entry end adjacent arriving cups and an exit end remote therefrom, the improvement comprising: means mounting said baffle to said outer wall of the housing in fixed relation to space said entry end of said baffle from said outer wall of the housing thereby to define an

opening between said baffle and said outer wall of the housing facing said linear path into which moving air and dust adjacent said endless belt can flow and be delivered from proximity to



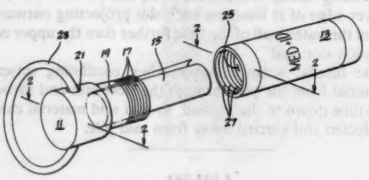
said cups as they move about said one pulley to minimize air turbulence thereat prior to discharging material from said cups.

4,333,562

CAPSULE FOR STORING WRITTEN INFORMATION

Michael A. Todd, 1121 Hacienda Blvd., Hacienda Heights, Calif. 91745

Filed Feb. 2, 1981, Ser. No. 230,315
Int. Cl.³ A45C *11/00*; B65D *83/00*
U.S. Cl. 206—37 **5 Claims**



1. A device for containing and protecting medical information upon a user to permit easy access and examination of said information in an emergency situation comprising:

a body member having a cavity therein, said cavity having an opening therein, said opening being constructed and adapted to receive a plug member in releasably sealed engagement therewith;

a roll of paper adapted to contain written medical information pertaining to said user; and

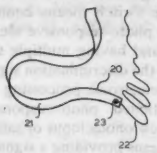
a plug member having a chamber therein; said chamber opening into said cavity when said plug member is engaged in said opening, said chamber being sized to tightly receive and securely retain one end of said roll of paper such that when said plug member is secured in said opening, the chamber and said roll of paper are unrestrictedly enclosed and protected by said body member and when said plug member is removed from said opening, said roll of paper is withdrawn from said body member and exposed and readily accessible so that said roll of paper may be easily removed from said plug member and examined.

4,333,563

FILM OR TAPE RETAINER DEVICE FOR REELS

Robert C. Hansard, 6711 Varna Ave., Van Nuys, Calif. 91401, and E. R. Brink, Jr., 922 Patterson Ave., Glendale, Calif. 91202

Filed Oct. 2, 1980, Ser. No. 193,347
Int. Cl.³ B65D *85/67, 85/671, 63/10*
U.S. Cl. 206—53 **6 Claims**



1. A film retainer for reel stored film comprising a closed loop of open mesh elastic material being relatively inelastic in a transverse direction and relatively elastic in a longitudinal direction, said elastic material having a maximum extension of at least 50% of its original length for elastic retention of film on a reel.

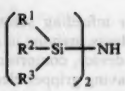
4,333,564

METHOD OF CONTROLLING RHEOLOGICAL PROPERTIES OF GEL-LIKE COMPOSITIONS

William Hertl, and Anthony R. Zine, Jr., both of Corning, N.Y., assignors to Sherwood Medical Industries Inc., St. Louis, Mo.

Continuation of Ser. No. 908,002, May 22, 1978, abandoned.
This application Jan. 16, 1980, Ser. No. 112,684
Int. Cl.³ B01D *21/26*; B01J *13/00*
U.S. Cl. 206—216 **21 Claims**

15. In combination, a blood separation tube, a water-insoluble, thixotropic, gel-like composition having a specific gravity of from about 1.03 to about 1.09, disposed in said blood separation tube, said composition comprising a liquid component including a material selected from the group consisting of silicone, mineral oil, polyester, butadiene polymer, and butylene polymer, and an inert, finely-divided filler including a material selected from the group consisting of glass, silica, mica, alumina, magnesia, and titania and having a density greater than about 1.03, a disilazane incorporated into said composition in an amount sufficient to reduce the composition viscosity or thixotropic index to the desired level, wherein the disilazane has the general formula,



in which R^1, R^2, and R^3 independently are selected from the group consisting of hydrogen, C_1–C_{18} alkyl, and C_2–C_4 alkenyl, with the proviso that no more than one of R^1, R^2, and R^3 can contain more than three carbon atoms.

4,333,565

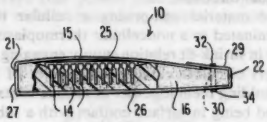
ANTI-STATIC PACKAGE FOR ELECTRONIC CHIPS

Larry N. Woods, 409 N. Rockborough Ct., Stone Mountain, Ga. 30083

Filed Feb. 27, 1981, Ser. No. 238,946
Int. Cl.³ B65D *73/02, 85/30*
U.S. Cl. 206—329 **2 Claims**

1. A magazine for a static electricity sensitive device of the type having a plurality of electrical terminals depending from a thin body, said magazine comprising an electrically conductive pad, said pad being comprised of a carbon black impreg-

nated high density polyurethane foam, the magazine pad further having opposed top and bottom surfaces joined with opposing end and side surfaces to form a unitary pad, the thickness of the pad between the pad top and bottom surfaces being sufficient to accomodate the electrical terminals of the device upon being embedded therein, a cover having two free ends wrapped about said pad top, bottom and end surfaces and sized to present end portions in mutually overlapping relation



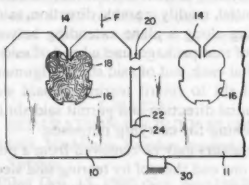
atop said pad top surface; said cover being wrapped about said pad top, bottom and end surfaces wherein the two free ends overlap on said top surface in a reentrant manner to apply clamping pressure to said pad, means fastening said cover to said pad comprising a staple having a bight overlaying one of the cover end portions from which two staple legs extend completely through said pad and the bottom surface of said cover.

4,333,566

CLOSURE STRIP

Jack H. Holmes, Cowiche, Wash., assignor to Kwik Lok Corp., Yakima, Wash.

Filed Dec. 1, 1980, Ser. No. 211,572
Int. Cl.³ B65D *85/24*
U.S. Cl. 206—343 **4 Claims**



1. In a multi-closure strip wherein the closures each have a side-edge, bag-neck access opening joining a bag-neck confining aperture, said closures being joined together in such strip by webs spaced transverse to the length of the strip, the webs having a thickness in the length direction of the strip to space adjacent closures, and each said web having a transversely enlarged central portion relative to the lengthwise direction of the strip and transversely reduced points of fracture on each end of said central portion at the juncture of the closure and web whereby separation of the closures by breaking the points of fracture will leave a smooth edge at each closure.

4,333,567

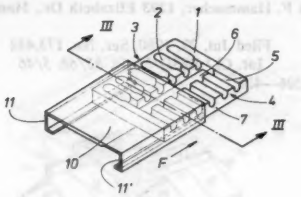
PLATE FOR PACKAGING DENTAL ROOT-CANAL INSTRUMENTS

Henri Leonard, Besancon, France, assignor to Micro-Mega S.A., France

Filed Mar. 31, 1980, Ser. No. 135,286
Claims priority, application France, May 31, 1979, 79 14659
Int. Cl.³ B65D *75/42*
U.S. Cl. 206—368 **4 Claims**

1. A container for packaging and dispensing root-canal instruments, notably nerve broaches, each having a shorter, thicker shank portion and a longer slender shaft portion, said container comprising;

a generally rectangular support having opposite side edges and opposite end edges, said support being formed of thin light material to provide an upper face and a plurality of spaced identical cavities formed in said upper face and extending parallel to one another and to end edges of said support, each of said cavities comprising a shorter, deeper, wider recess shaped and dimensioned to receive said shank portion of one of said instruments, said recess being located near one side edge of said support, and a longer, shallower and narrower groove shaped and dimensioned to receive said slender shaft portion of said instrument, said groove extending from said recess to the opposite side edge of said support, a central longitudinally extending channel formed in said upper face and extending substantially the full length thereof, said channel intersecting said grooves and having a depth greater than the depth of said grooves and a width to receive finger tips of a user, said support having at opposite side edges thereof depending



skirt elements extending down from said upper face and having a height at least equal to the depth of said recesses, and

a rigid cover molded of plastic material and comprising a top having a longitudinally extending central portion only engaging said upper face of said support while side portions of said top are recessed from the upper face of said support, and opposite side flanges extending down from said top outwardly of said side edges of said support and having inturned lower edge portions engaging under lower edges of said skirt portions of said support, said cover being thereby slidable longitudinally of said support to uncover individually instruments in said cavities,

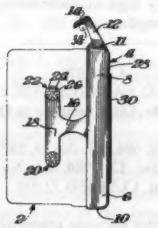
at least one of said support and cover being transparent so that said instruments can be seen.

4,333,568

CASSETTE TAPE DUST COVER

Karl D. Weldin, Wilmington, Del., assignor to Jerre E. Epps, Philadelphia, Pa., a part interest

Continuation-in-part of Ser. No. 955,593, Oct. 30, 1978, abandoned. This application Jul. 7, 1980, Ser. No. 166,760
Int. Cl.³ B65D *85/67, 45/00, 59/06*
U.S. Cl. 206—387 **5 Claims**



1. A storage case for a recording tape cassette for locking the spindles of the cassette reels against rotation and for protecting an open side of the cassette, said storage case comprising:

a casing member having a base wall, two flat, substantially parallel side walls which form a U-shaped member with said base wall, and a pair of end walls substantially perpen-

dicular to said side walls and enclosing said U-shaped member, said side walls and said end walls having substantially equal width to define an opening opposed to said base wall and adapted for receiving the open side of the cassette;

a flexible strap extending from one side of said U-shaped member and having two spindle pegs mounted thereon, said pegs adapted to fit into the spindles of the cassette reels to prevent the reels from rotating; and

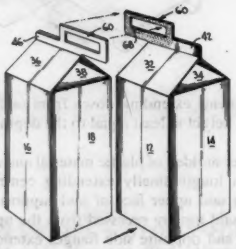
a hook-shaped member mounted on one of said end walls for hanging the case, with a cassette therein, on a horizontal rod.

4,333,569

CARRYING HANDLE FOR DETACHABLE CONTAINERS AND CONTAINERS INCLUDING SUCH HANDLE

Margaret F. Hammacher, 1293 Elizabeth Dr., Hamilton, Ohio 45013

Filed Jul. 29, 1980, Ser. No. 173,432
Int. Cl.³ B65D *75/56, 85/62, 5/46*
U.S. Cl. 206—431 **12 Claims**



1. A container adapted to facilitate pouring and carrying comprising:

(a) a bottom wall;

(b) a plurality of side walls foldably connected to and extending upwardly from said bottom wall;

(c) a gable top closure foldably connected to and extending upwardly from said side walls, said gable top closure including slanting roof panels, said closure having first and second ends and a pour spout located at one of said ends; and

(d) a handle assembly connected to and extending upwardly from said top closure, said handle assembly having a first end connected to said closure and a second end extending beyond said closure and one of said side walls, said handle assembly including a handle, said handle having two faces, one of said handle faces being coated with an adhesive which is relatively high in shear strength and relatively low in tensile strength.

4,333,570

MERCHANDISING PACKAGE FOR CONTAINERS

James E. Heider, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 694,267, Jun. 9, 1976, abandoned. This application Mar. 13, 1980, Ser. No. 129,955
Int. Cl.³ B65D *71/08*
U.S. Cl. 206—432 **18 Claims**

1. A multiple container package comprising

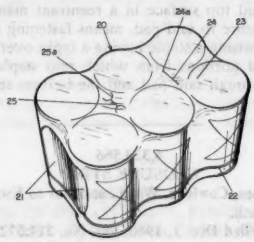
a plurality of upright filled and closed containers grouped in side-by-side engagement with their central axes substantially parallel and disposed normal to a longitudinal dimension of the package; and

an open ended sleeve of preoriented, shrinkable thermoplastic material encircling said group of the containers disposed along the longitudinal dimension of the group and shrunken snugly about said group of containers covering substantially at least their longitudinal extent in the package;

said preoriented material of the sleeve being characterized as a substantially uniaxially oriented, opaque, laminated, thermoplastic material capable of shrinkage in the circumferential dimension of said sleve at least 2½ times shrinkage capability in the axial dimension thereof and being readily tearable in the circumferential direction and tear resistant in the axial direction;

said sleeve material comprising a cellular thermoplastic layer laminated to a noncellular thermoplastic film layer;

said sleeve in shrink-fit relation snugly engaging the group of containers circumferentially and axially of the package tightly holding them together in surface contact with each other and being in surface contact with a substantial portion of that part of each of the side, top and bottom surfaces of each container which surfaces constitute the exterior of said group; and



said sleeve including at least one slit therein extending in the circumferential, readily tearable direction, said at least one slit extending along a plane extending between adjacent containers of said package, and a bead of said thermoplastic material at each end of said slit in alignment with each end of said slit to retard tearing of said sleeve in said circumferential direction and permit said slit to be used as a finger opening for carrying purposes;

whereby, containers may be removed from a portion of said package at one end thereof by tearing said sleeve about its circumference along a plane extending substantially between adjacent containers and separating one portion of said sleeve from the remaining portion of said sleeve such that the remaining portion of said package is left intact and constitutes a shorter package with respect to said longitudinal dimension.

4,333,571

PACKAGING UNIT FOR FRUIT OR LIKE ARTICLES

Nerio Martelli, Bologna, Italy, assignor to NESPAK S.p.A. Societa' Generale per l'Imballaggio, Massa Lombarda, Italy

Filed May 22, 1980, Ser. No. 152,480
Claims priority, application Italy, May 30, 1979, 12622 A/79
Int. Cl.³ B65D *85/34, 21/02, 23/00*
U.S. Cl. 206—499 **9 Claims**

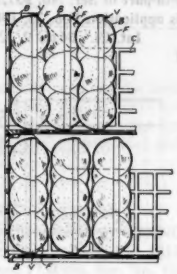
1. A packaging unit for the packaging of fruit or like articles comprising, in combination:

a rigid, box-like container having an accessible top, a bottom and four sides; and

a plurality of substantially rectangular pocket trays mountable in said container with one end of said trays resting on said container bottom and the other end of said trays located at said container top such that said trays are substantially vertical when said container is resting horizontally on its bottom,

and in a tray that presents, when disposed horizontally, a plurality of staggered parallel rows of upwardly directed pockets having a vertical cross-section generally conforming to the shape of the fruit or like articles to be placed

therein, and in which the top rim of each pocket has an approximately triangular shape in plan and has curvilinear convex sides, and in which the vertices of each pocket are arranged at a higher level than the sides joining said vertices, whereby two adjacent pockets of one row and the intermediate pocket of the adjoining staggered row define a triangular pyramidal projection in correspondence of the common vertex, wherein the improvements in said pocket trays that permit their vertical packing in said container without damage to the contents of said pockets include



said tray being made of foamed plastic sheet having a thickness in the pocket areas so as to afford a sufficiently sturdy structure that the pocket sides can operate as shelves to hold the pocket contents in the pocket, and

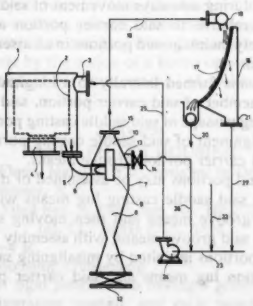
at least the side of said pyramidal projection forming a part of said intermediate pocket being concave so that the pocket contents rest on said concave side of said pyramidal projection whenever said tray is disposed in a substantially vertical orientation.

4,333,572

SEPARATION OF PULP FLOW

Rune H. Frykhult, Huddinge, Sweden, assignor to AB Celleco, Stockholm, Sweden

Filed Dec. 15, 1980, Ser. No. 216,560
Claims priority, application Sweden, Dec. 18, 1979, 7910404
Int. Cl.³ D21D *5/16, 5/24*
U.S. Cl. 209—17 **3 Claims**



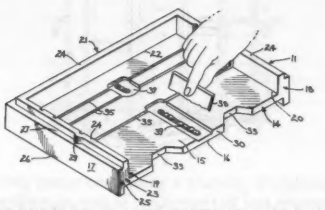
1. A method for separating a pulp-containing stream having impurities which are partly relatively light coarse particles and partly relatively heavy coarse particles, said method comprising the steps of feeding said stream to a sieving locus and there separating the flow into at least one pulp flow and one coarse reject flow, said coarse reject flow containing substantial amounts of the coarse particles and pulp, feeding the coarse reject flow into a hydrocyclone separator and there separating said reject flow into three separate flows, namely, a second pulp flow, a heavy reject flow containing a substantial amount of said relatively heavy particles, and a light reject flow containing a substantial amount of said relatively light particles, and feeding said light reject flow to a bow sieving locus and there separating the light reject flow into a flow enriched in light particles, which do not pass through the bow sieve, and a flow enriched in fibers.

4,333,573

STACKABLE TRAY

Verne R. Holoubek, Branch Road Farm, Ixonia, Wis. 53036

Filed May 23, 1980, Ser. No. 152,560
Int. Cl.³ B42F *17/12*
U.S. Cl. 211—11 **3 Claims**



1. A stackable tray for the storage of an item, comprising

a base having an upper surface to support said item and a spaced lower surface,

a pair of side walls and an end wall connected to said base and including means to support another stacked tray to form a substantial enclosure about said upper surface by said side walls and said end wall of one tray and the lower surface of an adjacent stacked tray with access to said substantial enclosure provided at a base front portion oppositely spaced from said end wall, and

a plurality of spaced separators integrally connected to said upper surface to project into said substantial enclosure to form a plurality of channels within said substantial enclosure, said separators adapted to be selectively broken away from said upper surface and to be removed therefrom to selectively enlarge one of the channels and to selectively limit the depth of entry of an item into the enlarged channel as desired for providing substantially enclosed storage adaptable to the relative length and width of the stored item.

4,333,574

WOOD RACK

R. Steven Christy, Sr., 389 Poplar Lent Rd., Concord, N.C. 28025

Filed Feb. 5, 1980, Ser. No. 118,745
Int. Cl.³ A47G *29/00*
U.S. Cl. 211—60 R **5 Claims**

1. A knock-down rack for firewood or the like including:

(a) a pair of rectangular spaced upright closed frames each having top, bottom, left and right side braces,

(b) said braces having vertical surfaces,

(c) a horizontal closed rectangular base frame having a pair of end braces and a pair of side braces,

(d) said horizontal closed rectangular frame receivable within one of said upright frames,

(e) one of said pair of upright frames having means for connecting it to one end of said horizontal closed rectangular frame adjacent said upright frame's bottom brace and the other of said pair of upright frames having means for connecting it to the other end of said horizontal frame adjacent said other upright frame's bottom brace,

(f) a hipped roof for said rack having a top side and an

underside including a pair of interconnected separable closed frames connected to said upright frames,

(g) said interconnected separable frames each including a pair of spaced vertical horizontal braces parallel to each other,

(h) each pair of spaced horizontal braces including a top support brace and an adjacent support brace,

(i) said top support braces mounted adjacent each other and directly engaging the top braces of said spaced upright closed frames,

(j) said adjacent support brace of one of said pair of separable frames mounted adjacent said left side braces of said upright frames and said adjacent support brace of the other of said pair of separable frames mounted adjacent said right side braces of said upright frames,

(k) said closed frames each being substantially similar in length and width and being substantially longer than wider and stackable one on the other for shipping prior to assembly, and

(l) said rack including ground engaging support means, and being open-sided to provide an unobstructed wood receiving opening therein.

4,333,575

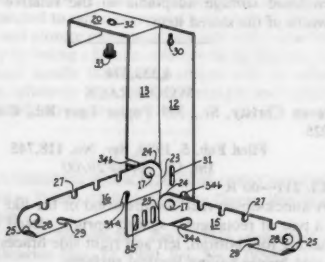
COLLAPSIBLE HANGER DEVICE

Joseph Wong, 855 Grenon Ave., Unit #2, Ottawa, Ontario, Canada (K2B 6G1)

Filed Sep. 18, 1980, Ser. No. 188,565

Int. Cl.³ A47F *5/00*

U.S. Cl. 211—118 **11 Claims**



1. A collapsible hanger device comprising:

an elongate member having a pair of mutually angularly disposed walls extending longitudinally thereof;

a pair of arms pivotally mounted on respective ones of said walls;

said arms being pivotal relative to said walls about respective mutually angled axes of pivotation between collapsed positions, in which said arms are nestled in an angular space defined by said walls with said arms extending longitudinally of said elongate member, and extended positions, in which said arms project laterally of said elongate member;

means for releasably supporting said arms in said extended positions; and

means for suspending said elongate member from a support.

4,333,576

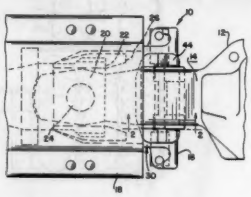
CARRIER ASSEMBLY FOR USE WITH A ROTARY RAILROAD COUPLER SYSTEM

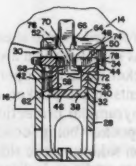
John W. Kaim, Chicago, Ill., assignor to Amsted Industries Incorporated, Chicago, Ill.

Continuation-in-part of Ser. No. 957,709, Nov. 6, 1978, abandoned. This application Feb. 25, 1980, Ser. No. 124,332

Int. Cl.³ B61G *9/22*

U.S. Cl. 213—61 **3 Claims**





1. In a rotary type railroad coupler system wherein a type E coupler head and cylindrical shank are rotatively joined to a yoke collar by a retractable pin, said shank being held substantially horizontal by a carrier assembly connected to a striker casting of said coupler system, said carrier assembly comprising a saddle casting portion and a carrier portion with said coupler shank being engaged with an upper cradle area of said saddle casting portion, an improvement in said carrier assembly comprising,

lug means formed on a bottom of said saddle casting portion, said lug means providing guidance of said saddle casting portion during sideways movement of said saddle casting portion relative to said carrier portion and locking to selectively maintain said portions in an assembled relationship, and

groove means formed laterally to a longitudinal slot in an upper member of said carrier portion, said groove means providing passage of said saddle casting portion lug means upon alignment of said saddle casting portion lug means and said carrier portion groove means,

wherein said portions may be assembled or disassembled by aligning said saddle casting lug means with said carrier portion groove means and then moving said lug means through said groove means, with assembly or disassembly of said portions inhibited by misaligning said saddle casting portion lug means and said carrier portion groove means.

4,333,577

TAMPERPROOF CLOSURE

George V. Mumford, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

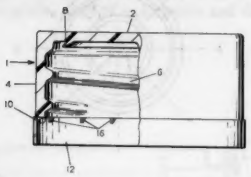
Filed Sep. 15, 1980, Ser. No. 186,938

Int. Cl.³ B65D *41/34*

U.S. Cl. 215—246 **2 Claims**

1. A molded thermoplastic closure comprising a disc-shaped

panel, and annular skirt depending from the periphery of said panel, a heat shrinkable annular band disposed in depending relation from the annular bottom edge of said skirt, said band having an outside diameter adjacent said annular bottom edge greater than the outside diameter of said skirt bottom edge and



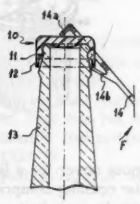
an inside diameter adjacent said annular bottom edge less than the outside diameter of said skirt adjacent to said edge, thereby defining a continuous shearable annular connection between said annular bottom edge of said skirt and the top annular portion of said band.

4,333,578

BOTTLE CAP HAVING OPENING MEANS

Giuseppe Di Nunzio, Via Filadelfia 130, 10137 Turin, Italy

Filed Jun. 17, 1980, Ser. No. 160,407
Claims priority, application Italy, Jun. 18, 1979, 53340/79[U]
Int. Cl.³ B65D *41/32*
U.S. Cl. 215—253 **1 Claim**



1. Bottle cap of synthetic resin material suitable for carbonated beverages which comprises a continuous peripheral relief member that is directed radially inwardly and which is substantially V-shaped in cross-section, said relief member being in juxtaposition with a mating groove in the neck of the bottle and beneath said member (11) a continuous, annular collar (12) spaced radially outwardly from the neck of the bottle and forming the lowermost portion of said bottle cap; said annular collar being subject to cracking during the removal of said cap from said bottle by the action of a bottle opener, thereby providing indication of previous removal of said cap.

4,333,579

PANEL FILTER HOUSING

Lawrence C. Flood, Hamlin, N.Y., assignor to Dollinger Corporation, Rochester, N.Y.

Filed Sep. 8, 1980, Ser. No. 185,372
Int. Cl.³ B65D *6/26, 6/34*
U.S. Cl. 220—4 R **12 Claims**

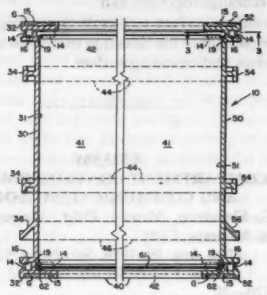
1. A filter housing, comprising

two pairs of rigid panels, each having a generally rectangular configuration overall, and each being substantially identical in cross sectional configuration,

a pair of spaced, parallel, similarly-shaped side rails formed along the two side edges, respectively, of each of said panels, and a plane, filter-supporting surface formed on one side of each panel and extending between the two side rails thereof, and

means releasably securing opposite ends of one of said pairs of panels to opposite ends of the other pair of panels, thereby to form a generally rectangular filter housing having therethrough a central opening bound by said plane surfaces on said panels,

each of said side rails having therein a plurality of spaced, parallel, longitudinally extending recesses, one of which opens at each end thereof on a corner of said rectangular housing in registry with one end of said one recess in another of said rails, and



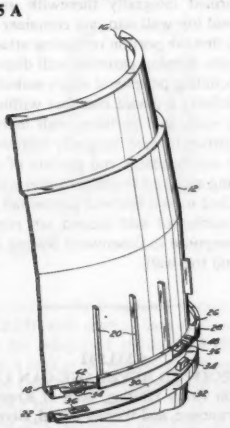
said securing means comprising a plurality of right-angular clip members located at the corners of said housing, and each clip member having opposite ends thereof frictionally engaged in a pair of said registering ends of said one recesses.

4,333,580

MECHANISM FOR LOCKING TWO HALVES OF AN UNDERGROUND VAULT

Robert L. Sweigart, Jr., Arcadia, Calif., assignor to Associated Plastics, Inc., Fountain Valley, Calif.

Filed Sep. 29, 1980, Ser. No. 191,396
Int. Cl.³ B65D *8/04, 41/06*
U.S. Cl. 220—5 A **5 Claims**



1. An underground vault comprising:

a first housing having an open end;

a second housing having an open end and an annular flange which projects outwardly from the exterior of said second housing;

said first housing having a resiliently deformable hook depending from said open end;

said flange having an opening extending therethrough, said

opening being of a size sufficient to permit said hook to pass through it;

said flange having a recess located proximal to said opening, and a camming surface, between said recess and said opening;

said hook having means for engaging said recess, said engaging means, upon mutual rotation of said housings, traversing said camming surface to engage said recess and lock said housings together; and

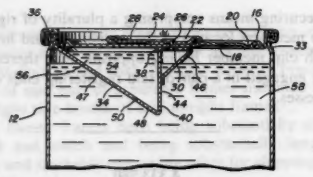
said camming surface resiliently deforming said hook in a plane parallel to the direction of motion of said hook as it traverses said camming surface.

4,333,581

MULTI-COMPARTMENT CONTAINER WITH POP-TOP AND COMMUNICATING DOOR

Donald G. Flansburg, Merced, Calif., assignor to Henry H. Howard, Modesto, Calif.

Filed Aug. 19, 1980, Ser. No. 179,932
Int. Cl.³ B65D *25/08, 41/32*
U.S. Cl. 220—20 **10 Claims**



1. A container for beverages, said container including an outer peripheral wall and top and bottom walls, said top wall spanning and being sealed relative to the upper marginal edges of said peripheral wall, said top wall having a first elongated tab portion formed integrally therewith and downwardly tearable from said top wall into said container with one bendable end of said first tab portion remaining attached to said top wall, an upwardly opening partition wall disposed below said top wall and including peripheral edges sealed relative to said top wall and defining a closed chamber within said container below said top wall, said partition wall including a second elongated tab portion formed integrally therewith and tearable therefrom with one bendable end portion of said second tab portion remaining attached to said partition wall, and connecting means attached to said first and second tab portions operative to effect tearing of said second tab portion from said partition wall response to downward tearing of said first tab portion from said top wall.

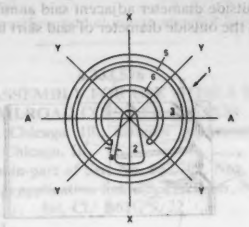
4,333,582

GROOVED BEVERAGE CAN LID

Siegfried Bloeck; Erich Höfling, both of Kreuzlingen; Rudolf Lüthi, Niederwangen, and Werner Diemi, Bern, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Oct. 3, 1980, Ser. No. 193,796
Claims priority, application Switzerland, Oct. 16, 1979, 9282/79
Int. Cl.³ B65D *6/34, 8/04, 41/02*
U.S. Cl. 220—66 **11 Claims**

1. A container lid for pressurized sealed containers comprising a top surface having a removable portion, said removable portion being located at an angle with respect to the rolling direction of the lid material selected from the group consisting of about 0° and 90°, said top surface further having stiffening grooves located at a 45° angle with respect to the rolling direction of the lid material wherein the strength of said lid is increased by about 10%.



4,333,583

DRINKING SPOUT COVER

Joseph Montemarano, Angie Dr., Hopewell Junction, N.Y. 12533

Filed May 1, 1980, Ser. No. 145,848
Int. Cl.³ B65D *41/32*
U.S. Cl. 220—90.4 **5 Claims**

1. A drinking spout cover for a liquid container having a substantially circular opening comprising:

a substantially circular main body portion of a plastic material having a slightly greater diameter than the container opening and a flexible and downwardly extending peripheral portion said body portion further including a central recessed portion of a cylindrical configuration extending downwardly from the main body portion and having a central aperture in the base thereof, said aperture permitting an outflow of air during closure of the cover on a container and a plurality of evenly spaced recessed channels, the majority of said channels extending from the central recessed portion towards the periphery of the cover, and

a drinking spout positioned on the main body portion towards the periphery of the cover and in line with one of said recessed channels, said spout comprising an upwardly extending hollow frustoconical member having an unobstructed interior, a cover integrally mounted across the upper end of the spout and having a tab extending outwardly therefrom for gripping purposes and said spout having a plurality of fine perforations circumferentially arranged about the upper surface thereof to permit ready removal of the cover for drinking purposes.

4,333,584

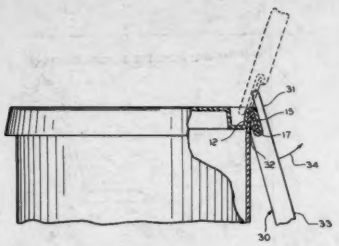
CONTAINER CLOSURE

John C. Gall, Chicago, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.

Filed Sep. 19, 1980, Ser. No. 188,807
Int. Cl.³ B65D *41/10, 41/12, 41/14*
U.S. Cl. 220—309 **11 Claims**

1. A closure for a container having a foldable resilient annular wall defining an opening comprising a bendable resilient

annular wall adapted to be disposed at least partially in contact with the foldable wall of the container, said bendable wall of said closure having a reversely bent annular lip disposed about the outer edge of the foldable wall of the container when said closure is disposed with said bendable wall of said closure at least partially in contact with the foldable wall of the container, said bendable wall of said closure and the foldable wall



of the container being reversably movable together between an unlocked position and a locked position upon application of force sufficient to achieve over-center snap action when said closure has said reversely bent lip disposed about the outer edge of the wall of the container, whereby said bendable wall of said closure may be repeatedly moved into and out of locking engagement with the foldable wall of the container.

4,333,585

DEEP-DRAWN PREFORMED CLOSURE FOR THE HERMETIC SEALING OF A CAN OR SIMILAR CONTAINER

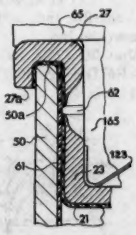
Luigi Del Bon, 141 Feldstrasse, 4663 Aarburg, Switzerland

Filed Jul. 10, 1979, Ser. No. 56,404

Claims priority, application Switzerland, Jul. 10, 1978, 7454/78; Feb. 17, 1979, 1539/79

Int. Cl.³ B65D *3/12, 3/22, 41/50*

U.S. Cl. 220—359 **3 Claims**



1. A deep-drawn preformed closure element adapted for the hermetic sealing of an opening of a can or similar container having a can body having a top and said opening in said top, the wall of which can body is lined on its inside surface with a protective coating which is rendered thermo-glueable upon heating, and said closure element being in a state ready for introduction and gluing into said opening of said can top and essentially consisting of a membrane deep drawn from an aluminum foil or similar sheet material, and being adapted for serving as a warranty seal for said container, said membrane comprising:

(a) a flat part, adapted for covering the top opening in said can body,

(b) an annular collar part, joined to the periphery of said flat part, said membrane bearing at least on the side of said collar part destined to contact said can body, a coating which is rendered thermo-glueable upon heating, whereby said collar part is adapted for being glued to the thermo-glueable coating of the inside wall surrounding the top opening of said can body,

(c) a peripheral rim-covering part, joined to the periphery of said collar part away from said flat part, and destined for covering the rim of said can about said can top opening, and

(d) collar part rupturing line means comprising at least one endless reduced thickness portion in said collar part, extending all the way thereabout, in a zone of said collar part extending parallel to the peripheral junction of said flat part with said collar part and intermediate said last-mentioned junction and the peripheral junction of said collar part with said rim-covering part, for separating the closure element into two parts, during assembly of the closure element to the can, through tensioning of said collar part in a direction substantially perpendicular to said flat part, and inwardly toward the can interior, and heating the same, whereby an upper portion of said collar part, above said collar part-rupturing line means, becomes thermo-glued to the underlying protective coating of the can body wall in an upper contact zone of the latter, and a lower portion of said collar part, below said collar part-rupturing line means, becomes thermo-glued sealingly to the underlying protective coating in a second, lower zone of the can body wall, while leaving a circumferential zone of said protective coating intermediate said first and second contact zone thereof uncovered and intact.

4,333,586

INSERTION MACHINE FOR INTEGRATED CIRCUITS

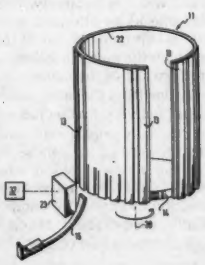
Gerd Stückler, Birkenweg 18, D-8151 Osterwarngau, Fed. Rep. of Germany

Filed Oct. 3, 1979, Ser. No. 81,332

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1979, 2844169

Int. Cl.³ B65G *59/06*

U.S. Cl. 221—106 **13 Claims**



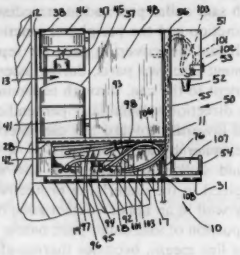
1. Insertion machine for integrated circuits, comprising a magazine (13,22,24) with several bars (13) arranged side by side to receive the integrated circuits (8,9,10) in a row one above the other, a lock at the bottom end of each of said bars, an output device (15,23) which receives and conveys the integrated circuits (8,9,10), after the lock of the bars (13) has been opened, from the bars (13) into a removal position, characterized in that a driving mechanism (14) moves the magazine (13,22,24) relative to said output device (15,23) common to the bars (13), a plate-shaped carrier (22,24) mounting said bars (13) and held exchangeably on said drive (14), the carrier is a flexible plate (22), which is bent into a hollow cylinder and secured on the driving mechanism (14), and is turned by the driving mechanism about the cylinder axis (20), said bars (13) are held removably on the plate (22,24) and carry locking elements (47,41) with complementary locking elements (39,45) in the plate (22,24).

4,333,587

BEVERAGE DISPENSER

Herman S. Fessler, Coon Rapids, Minn., and William A. Harvill, Stone Mountain, Ga., assignors to The Coca-Cola Company, Atlanta, Ga. and The Cornelius Company, Anoka, Minn., part interest to each

Filed Jan. 31, 1980, Ser. No. 117,330
Int. Cl.³ B67D *5/56*
U.S. Cl. 222—129.1 **16 Claims**



1. A pressurized fluid powerable post-mix beverage dispenser comprising:

(a) an exterior cabinet having a front end with a dispensing nozzle and a drip tray;

(b) means dividing the interior of the cabinet into first and second discrete compartments;

(c) refrigeration means for cooling beverage ingredients, said refrigeration means being in the first compartment;

(d) a drawer trackway in the second compartment;

(e) a slide drawer in the second compartment, said drawer being slidably mounted to the trackway and having thereon a fluid powerable syrup pump, a bulkhead for fluid lines, a propellent fluid line from the bulkhead to the syrup pump for supply of propellent fluid to the pump, and product lines from the bulkhead to the syrup pump for supply of syrup and water respectively, said drawer being slidably withdrawable to an alternate access position in which the drawer is substantially out of the second compartment and in which the pump, bulkhead, fluid lines and product lines are forward of the cabinet front end; and

(f) a product delivery line from the pump to the refrigeration means, said product delivery line including a length normally within the second compartment, said length being flexible and being forward of the cabinet front end when the drawer is in the access position, enabling slidable withdrawal of the drawer and all components thereon without disconnection of any syrup components for providing substantially unobstructed access to the pump without requiring disconnection of any line.

4,333,588

ICE DISPENSER ASSEMBLY

Raymond M. Schreck; Bill G. Brown, and David A. Gilda, all of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

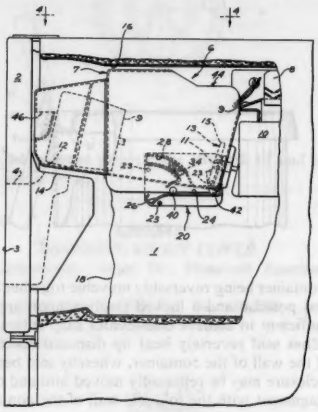
Filed Aug. 8, 1980, Ser. No. 176,301
Int. Cl.³ F25C *5/18*
U.S. Cl. 222—164 **8 Claims**

1. An ice dispenser assembly for use in a freezer compartment of a refrigerator including a motor-driven ice dispenser comprising;

an ice piece storage receptacle having an open top and including means for dispensing ice pieces contained therein,

a stationary track member on each side of the receptacle, each track member having a rearward horizontal portion, a forward downwardly curved portion, and a forward upwardly curved portion,

two pairs of spaced guide elements, each pair including a forward guide element and a rearward guide element, one pair of said guide elements being secured to the receptacle on each side thereof and slidable in each of the respective stationary track members to move the receptacle from a first position to a second position, said pairs of guide elements being located in the rearward horizontal portion



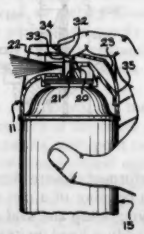
of the track members when the receptacle is in its first position and the forward guide element of each pair of guide elements is in the downwardly curved portion and the rearward guide element of each pair is in the upwardly curved portion when the receptacle is in its second position.

4,333,589

CHILD-RESISTANT OVERCAP FOR A PRESSURIZED CONTAINER

Randall G. Bush, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Jun. 30, 1980, Ser. No. 163,939
Int. Cl.³ B67D *5/32*; B65D *83/14, 51/20*
U.S. Cl. 222—402.11 **7 Claims**



1. A child-resistant overcap for a pressurized container which includes a dispensing valve at the center top thereof, said container also having an annular assembly seam surrounding said valve and a tubular nozzle axially moveable to actuate said valve, said overcap comprising, in combination,

(a) a generally cup-shaped body having (1) a depending skirt with a lip at its lower margin that is adapted to engage said seam for retaining said overcap on said container, (2) an axial opening that is adapted to receive said axially moveable nozzle and (3) a top having a finger depression extending across said top and intersecting said axial opening,

(b) a valve guard unitary with said body and mountable in

the finger depression for movement between a valve-guarding position and a valve-actuating position said valve guard including a valve actuator movable relative to said valve guard in all of its positions and being movable into actuating engagement with said nozzle only when said valve guard is in said valve actuating position,

(c) co-operating means on said guard and said body for guiding said guard between such positions, and

(d) resilient means formed integrally with said body and guard and biasing said guard toward such guarding position.

4,333,590

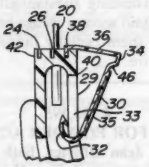
GARMENT HANGER

Raymond A. Princiotta, 208 N. Concord, Havertown, Pa. 19083

Filed Jan. 10, 1980, Ser. No. 110,953

Int. Cl.³ A47J *51/08*

U.S. Cl. 223—85 **12 Claims**



1. A garment hanger having a hook connected to a body which has arms extending therefrom, the improvement comprising an adjustable spacer on the body, means on the upper end of the body adjacent the hook for selective mating cooperation with any one of at least two operative positions associated with one end portion of said spacer so that said spacer portion is adjustable between said operative positions for adjusting the effective width of said body to thereby limit the extent to which two such hangers can approach one another on a rack, said spacer portion being generally perpendicular to said arms, and an abutment surface on the other end portion of said spacer for contact with another hanger on a rack.

9. A garment hanger having a metal hook connected to a plastic body which has arms extending therefrom, the improvement comprisng a plastic spacer adjustably supported by the body and cooperating therewith to define the width of the body, said spacer being adjustable relative to the body between at least two operative positions for adjusting the effective width of the body to thereby limit the extent to which two such hangers can approach one another on a rack, said spacer having a generally horizontal member, a tongue on one end portion of said member, said member having an abutment surface on the opposite end portion for contact with another hanger on a rack, said hook having a shank portion, and means defining at least one slot on opposite sides of said hook shank portion and generally perpendicular to said shank portion for selective receiving said tongue when said spacer is in one of said operative positions.

4,333,591

BABY BACKPACK SACK

Dorothy S. Case, 2101 Forest Park Dr., Anchorage, Ak. 99503

Filed Oct. 14, 1980, Ser. No. 196,287

Int. Cl.³ A47D *13/02*

U.S. Cl. 224—160 **15 Claims**

1. A baby backpack sack adapted to substantially completely enclose a backpack carrier having shoulder straps, comprising:

a first generally rectangular panel defining a first side of the sack, said first panel having an upper edge, a lower edge and first and second side edges;

a second generally rectangular panel defining a second side of the sack, said second panel having an upper edge, a lower edge, said first and second side edges, with said first panel and said second panel being joined to one another along only a portion of said first side edges and said second side edges;

a third generally rectangular panel defining a bottom of said sack, said third panel having a first lower edge, a second lower edge and first and second side edges,

said third panel being joined along said first lower edge to said lower edge of said first panel,

said third panel being joined along said second lower edge to said lower edge of said second panel,

said third panel being joined along a portion of said first side edge to the remainder of said first side edge of said first panel and being joined along the remainder of said first side edge to the remainder of said first side edge of said second panel and

said third panel being joined along a portion of said second side edge to the remainder of said second side edge of said first panel and being joined along the remainder of said second side edge to the remainder of said second side edge of said second panel; and

means for facilitating passage of said shoulder straps of said backpack carrier through said first panel.

4,333,592

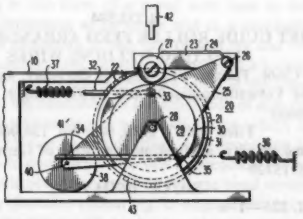
APPARATUS FOR HANDLING DEFORMABLE COMPONENTS SUPPORTED IN A MATRIX

William Z. Marder, Pennington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 30, 1980, Ser. No. 221,377

Int. Cl.³ G03B *1/18, 1/24*

U.S. Cl. 226—52 **7 Claims**



1. An apparatus for handling deformable component parts supported in a contiguous matrix comprising:

a wheel, the circumferential surface of which is configured in an integral number of equal facets, and having an indexing tooth protruding radially outward from each facet; said wheel being rotatably mounted at its axis of rotation to a base structure;

a generally longitudinal linking element having a first end rotatably mounted to the base structure to rotate about the

same axis as the wheel, said linking element extending radially from said axis;

a clamp plate having a first end pivotally mounted to a second end of the linking element, said plate having a second end arranged substantially tangent to the wheel so that a surface of the plate may be positioned parallel with a facet of the wheel by rotation of the linking element and the matrix may be threaded between said plate and said facet, said plate surface having a recess for engaging an indexing tooth of the wheel and thereby causing the wheel to rotate when the linking element is rotated.

4,333,593

FEEDER FOR FEEDING STOCK TO MACHINES OR DEVICES

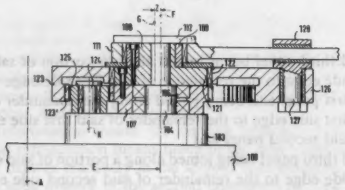
Otto Bihler, Schleiferweg 2, D-8959 Halblech, Füssen, Fed. Rep. of Germany, and Eduard Brüller, Trimbach, Switzerland, assignors to Otto Bihler, Füssen, Fed. Rep. of Germany

Continuation of Ser. No. 875,449, Feb. 6, 1978, abandoned. This application Apr. 6, 1979, Ser. No. 27,774

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1977, 2706351; Sep. 13, 1977, 2741149

Int. Cl.³ B65H *17/36*

U.S. Cl. 226—122 **36 Claims**



1. In a device for feeding stock to machines or devices having a feeding slide reciprocable in a straight line between two terminal positions and a driving device for the feeding slide including a first eccentric pin eccentrically revolving about an axis of revolution and temporarily leaving the feeding slide stationary in its two terminal positions during continued revolution of the eccentric pin, the improvement comprising an auxiliary device initiating periodic movement of the feeding slide which is superposed on the movement caused by revolution of the eccentric pin at least in the region of the terminal positions of the feeding slide, the auxiliary device including a second eccentric pin revolving about a second axis of revolution at a higher rate of revolution than said first eccentric pin.

4,333,594

PLANET GUIDE ROLLER FEED ARRANGEMENT FOR MELTING WELDING WIRES

Erwin Cloos, Haiger, Fed. Rep. of Germany, assignor to Carl Cloos Verwaltungsgesellschaft oHG, Haiger, Fed. Rep. of Germany

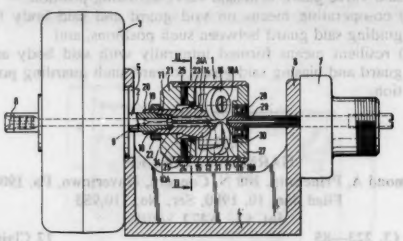
Filed Apr. 7, 1980, Ser. No. 138,060

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1979, 2915320

Int. Cl.³ B65H *17/22*

U.S. Cl. 226—176 **13 Claims**

1. In a planet guide roller feed arrangement for advancing a meltable guide wire, including at least two planet guide rollers, first means for supporting said guide rollers at circumferentially spaced locations about the axis of said wire, the axis of each said roller being skewed at an acute angle with respect to the axis of said wire and each said guide roller being movable in a direction substantially radially of said wire, second means for urging said rollers into engagement with said wire, and drive means for effecting rotation of said guide rollers around the axis of said wire, the improvement comprising a sleevelike bearing part having at least two slots therein which extend axially from one end thereof a portion of the length thereof, said slots defining at least two axially extending, resiliently flexible arms, each said guide roller being supported on a respective one of said arms adjacent said one end of said bearing part, said wire extending substantially coaxially through said bearing part and said second means being engageable with said arms for flexing them radially inwardly until said guide rollers engage said wire.



4,333,595

OFFSET PISTON FOR POWDER ACTUATED TOOLS

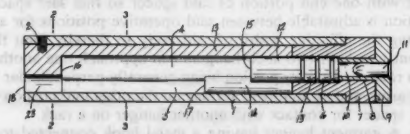
Marc Combette, and Jean Ollivier, both of Valence, France, assignors to Olin Corporation, New Haven, Conn.

Filed Apr. 9, 1980, Ser. No. 138,788

Claims priority, application United Kingdom, Apr. 10, 1979, 7912654

Int. Cl.³ B25C *1/14, 1/18*

U.S. Cl. 227—10 **12 Claims**



1. An improved barrel assembly for a powder-actuated tool comprising a right cylindrical barrel member and a piston, said barrel member being provided with first and second communicating, longitudinal bores, said bores each being transversely offset and each being closed at one end and opening into opposite ends of said barrel member, said piston comprising at least a first portion slidable in said first bore and a second portion slidable in said second bore.

4,333,596

HIGH STRENGTH NEEDLE ASSEMBLY WITH SHARPENABLE CUTTING EDGE

Steven Kunreuther, 285 Central Park W., New York, N.Y. 10024

Continuation of Ser. No. 55,542, Jul. 9, 1979, Pat. No. 4,273,279. This application Jul. 28, 1980, Ser. No. 172,690

The portion of the term of this patent subsequent to Jun. 16, 1998, has been disclaimed.

Int. Cl.³ B25C *1/00*

U.S. Cl. 227—67 **11 Claims**

1. A needle assembly for dispensing fasteners or the like

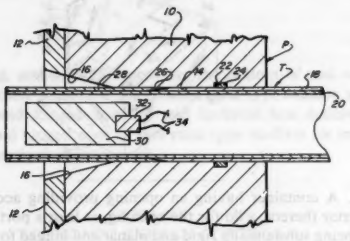
comprising a substantially cylindrical base having a central bore, a needle extending from one end of said base, said needle having an outer diameter smaller than the outer diameter of said base, a knife integral with and extending from and beyond the other end of said base, said knife comprising a cutting edge spaced from said other end of said base.

4,333,597

METHOD OF EXPLOSIVELY FORMING BI-METAL TUBEPLATE JOINTS

Roy Hardwick, Louisville, Colo., assignor to Explosive Fabricators, Louisville, Colo.

Filed May 27, 1980, Ser. No. 153,047
Int. Cl.³ B23K *20/08*
U.S. Cl. 228—108 **7 Claims**



4. A method of explosively bonding two cylindrical parallel members to each other and to a body defining a conical anvil surface through which they extend, including the steps of:

positioning an inner metallic tube within an outer metallic tube in contiguous parallel relationship;

placing an outer end of the tubes within a body defining an aperture having a conical anvil surface sloping away from a surface of the outer tube at one side of the aperture;

providing an explosive charge having a detonation velocity greater than 120% of the sonic velocity of the metallic tube with the greater sonic velocity within the inner tube extending substantially the length of the conical anvil surface; and

igniting the explosive charge at an inner end within the tubes causing the inner tube to progressively expand and be driven against the outer tube along a collision point moving at supersonic velocity toward the outer end of the tubes to expand the outer tube until it strikes the anvil surface resulting in a first pressure point moving at subsonic velocity as the outer tube strikes the anvil surface and a second pressure point moving at subsonic velocity as the inner tube impacts against the now stationary outer tube creating a weld between the surfaces of the anvil and the outer tube and between the surfaces of the outer tube and the inner tube.

4,333,598

METHOD OF BRAZING HONEYCOMB AND PANEL ASSEMBLIES

Nelson C. Ittner, Encino, and William I. Rooke, Blue Jay, both of Calif., assignors to Alloy Spot Welders, Inc., Los Angeles, Calif.

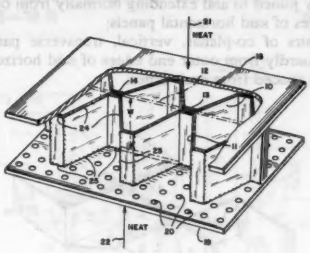
Filed Sep. 8, 1980, Ser. No. 185,305
Int. Cl.³ B23K *31/02*
U.S. Cl. 228—181 **9 Claims**

1. A method of brazing honeycomb cells to top and bottom panels including the steps of:

(a) providing ribbon segments of brazing foil having widths substantially equal to the cell heights between the panels;

(b) positioning said ribbon segments between successive honeycomb cell nodes so as to lie essentially in parallel planes bisecting the cells and extending normal to the planes of the top and bottom panels when positioned to sandwich the honeycomb cells therebetween; and,

(c) applying heat to the top and bottom panels to melt the ribbon segments of brazing foil to a liquid resulting in the liquid filling the joints defined between the nodes of the



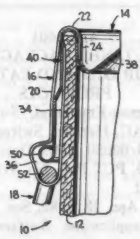
cells with each other and the top and bottom contact joint lines of the cell walls with the top and bottom panels whereby excess brazing material on the panel surfaces covering the open cell portions free of joints is virtually eliminated.

4,333,599

CRIMPED-ON DRUM COVER HANDLE

Michael J. Stemen, Bolingbrook, Ill., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Dec. 17, 1980, Ser. No. 217,351
Int. Cl.³ B65D *25/28, 45/16*
U.S. Cl. 229—5.7 **10 Claims**



1. A side handle hinge member for a fibre drum, said hinge member being in the form of a metal strip bent to define a primary leg terminating at an upper end in a reversely bent anchor portion extending to one side of said leg and forming means for engagement over a cover rim portion, a locking flap extending from said anchor portion, an offset at the lower end of said primary leg extending to the other side of said primary leg, said offset terminating in a depending leg which in turn terminates in a reverse bend; said offset, said depending leg and said reverse bend combining to define a receptacle for a cover curl and a handle pivot bar; and said reverse bend terminating in an upwardly direction anchor leg for engagement between a cover skirt and a drum wall.

4,333,600

SIX-CELL PARTITION

Jeffrey M. Gardner, Wheaton, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Sep. 26, 1980, Ser. No. 191,313
Int. Cl.³ B65D *5/48*
U.S. Cl. 229—42 **9 Claims**

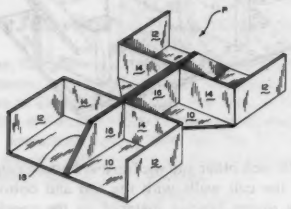
1. An internal partition device, formed of a unitary blank of

foldable sheet material such as paperboard, for forming six cells within an outer container or wrapper, comprising:

(a) a pair of co-planar, horizontal panels having outer end edges and corresponding transverse edge portions spaced from each other;

(b) pairs of opposed vertical, longitudinal, side panels foldably joined to and extending normally from opposed side edges of said horizontal panels;

(c) pairs of co-planar, vertical, transverse panels spaced inboardly from outer end edges of said horizontal panels and spaced from each other;



(d) each of said transverse panels being foldably joined at its outer end to an inner end of a related side panel;

(e) a vertical, longitudinal, center partition member positioned intermediate corresponding side panels and including:

(i) a pair of outer panels each being foldably joined at its opposite ends to inner ends of related transverse panels;

(ii) at least one inner panel foldably joined at one edge to an edge of a related outer panel;

(iii) said inner panel being sandwiched between said outer panels in parallel relation therewith.

4,333,601

ALUMINUM FOIL LINED PACKAGE, PARTICULARLY SUITABLE FOR OIL- AND FAT-CONTAINING PRODUCTS

Jakob Grimm, Langnau-Emmental, Switzerland, assignor to Inauen Machinen AG, Herisau, Switzerland

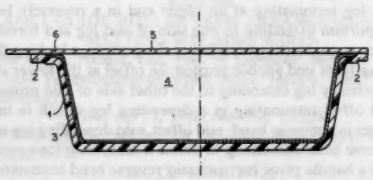
PCT No. PCT/CH80/00050, § 371 Date Jan. 2, 1981, § 102(e) Date Dec. 30, 1980, PCT Pub. No. WO80/02412, PCT Pub. Date Nov. 13, 1980

PCT Filed Apr. 28, 1980, Ser. No. 227,086

Claims priority, application Switzerland, May 2, 1979, 4094/79

Int. Cl.³ B65D *5/56, 5/64*

U.S. Cl. 229—43 **2 Claims**



1. A food-packaging container comprising an upwardly open cup-shaped receptacle having an outer plastic layer and an inner aluminum foil lining, said receptacle having downwardly tapering walls, a base unitary with said walls and an outwardly directed horizontal flange surrounding a mouth of said receptacle and lying in plane, said plastic layer extending to the outer periphery of said flange and said lining extending over the entire base and walls and having an outwardly directed portion overlying said layer of said flange but terminating inwardly of said periphery whereby a peripheral zone of the material of said layer is exposed from above on said flange, and an aluminum cover closing said mouth of said receptacle and extending over said zone and bonding directly to said layer at said zone.

4,333,602

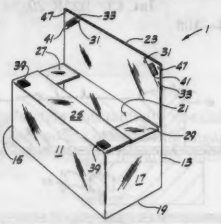
RECLOSABLE CONTAINER

Robert C. Geschwender, Lincoln, Nebr., assignor to Concept Engineering Inc., Lincoln, Nebr.

Filed Nov. 26, 1980, Ser. No. 210,284

Int. Cl.³ B65D *5/66*

U.S. Cl. 229—44 R **4 Claims**



1. A container having an opening providing access to the interior thereof, a lid for the opening, at least a portion of said lid being substantially rigid and planar and hinged for swinging about a hinge line from a first position overlying a substantially rigid planar portion of the container to a second position away from said container portion, and a two-part fastener for releasably securing said lid portion to said container portion thereby to maintain the lid closed, the first part of said fastener being secured to said container portion and the second part to said lid portion closely adjacent said hinge line with the lid portion extending outwardly beyond said second part and serving as a lever for swinging said lid portion from said first position in which said fastener parts are interengaged for maintaining the lid closed to said second position in which said fastener parts are disengaged for permitting the lid to be opened, said container being recloseable by swinging the lid portion back to said first position, said fastener parts being secured to said lid and container portions by clips receivable in openings in the lid and container portions for clipping said fastener parts in position.

4,333,603

MAILBOX WITH LOCKABLE LETTER MAIL COMPARTMENT FOR USE IN MOTORIZED DELIVERY ROUTES

Raymond A. Carlson, 4147 E. Whittier, Tucson, Ariz. 85711

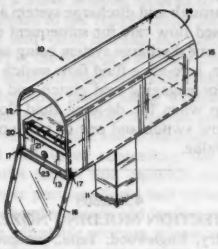
Continuation-in-part of Ser. No. 957,536, Nov. 3, 1978, abandoned. This application Jan. 15, 1980, Ser. No. 112,296

Int. Cl.³ A47G *29/12*

U.S. Cl. 232—17 **3 Claims**

1. In a rural-type mailbox having a flat rectangular floor, a short back plate, side walls extending no higher than the back plate, and a cover that may be formed by extending the side wall on one side over to the side wall on the other side in a form which conforms to the shape of the back plate, said side walls being flat over at least an initial part extending up from said floor, and a hinged door opposite said back plate, said hinged door conforming to the shape of said back plate to fit the opening between said side walls and between the floor and the cover, the combination of a lockable box inside of said rural-type mailbox for receiving letter mail, said lockable box being comprised of a flat rectangular bottom, flat rectangular sides extending from said bottom to a height less than the height of said back plate of said rural-type mailbox, a top, and a front closure at one end, said lockable box closely fitting inside said rural-type mailbox with the closure thereof placed

just behind said hinged door of said rural-type mailbox, a slot in said lockable box through which letter mail may be inserted, said closure comprising a hinged door through which letter mail may be removed from said lockable box, and said hinged door of said lockable box having a key-operated mechanism



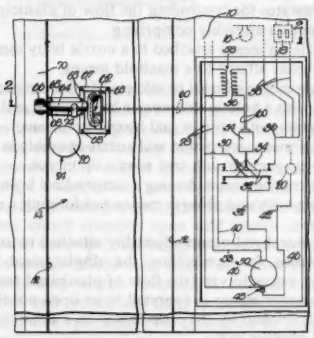
for locking, and means for securing the bottom of said close fitting lockable box to the floor of said rural-type mailbox with said slot and hinged door of said lockable box accessible through said hinged door of said rural-type mailbox for insertion and removal of letter mail.

4,333,604

ECONOMIC ENERGY CONTROL

Gary M. Petrillo, 47 Corey Rd., North Haven, Conn. 06473

Filed Apr. 13, 1981, Ser. No. 253,692
Int. Cl.³ E05B *65/00*; H01H *27/06*
U.S. Cl. 236—46 R **4 Claims**



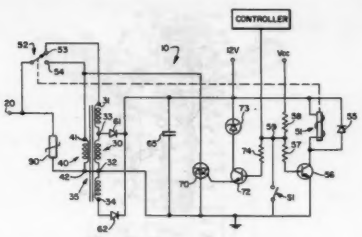
1. A system for controlling the energy consumption of an energy-operated device in a room having a door movable into open and closed positions and a source of electrical energy, comprising a circuit for said device including said energy source, for rendering said device operative and inoperative on closing and opening said circuit, respectively a first switch in said circuit spring-urged into closed position and shiftable into open position to close and open said circuit respectively, a time delay relay adapted when energized, to hold said switch in said closed position for a preset delay period and then shift it into said open position, a circuit for said relay including a master switch of push button type mounted on said door and having its push button formed as a latch bolt manipulatable on the inside of said door, a catch in the room into and from which said latch bolt is projectible and retractible to lock and unlock said door, respectively, from the inside of the room, with said master switch being opened and closed to open and close said relay circuit on projection and retraction, respectively, of said latch bolt.

4,333,605

VARIABLE INPUT-RESISTANCE POWER SUPPLY CIRCUIT

Kenneth R. Peters, Billerica, Mass., assignor to American Stabilis, Inc., Lewiston, Me.

Filed Apr. 17, 1981, Ser. No. 255,177
Int. Cl.³ H01H *9/00*; G05D *15/00*
U.S. Cl. 236—78 R **10 Claims**



2. In a temperature control system including an input voltage signal, a power supply circuit comprising:

a transformer having a core, input terminals, and output terminals;

a primary winding electromagnetically coupled to said core of said transformer such that the rms voltage at said output terminals remains larger than a minimum voltage level whether said input voltage signal is connected to said input terminals of said transformer or to said primary winding, said primary winding having input terminals separated by an impedance which is substantially smaller than the impedance between said input terminals of said transformer;

voltage limiting means connected to said primary winding for monitoring said rms voltage at said output winding and for ensuring that said rms voltage at said output terminals does not exceed a predetermined level when said input voltage signal is connected to said input terminals of said primary winding; and

switching means for connecting said input voltage signal to said input terminals of said transformer if said temperature control system is in a first state requiring a large voltage across said power supply circuit, and for connecting said input voltage signal to said input terminals of said primary winding if said temperature control system is in a second state requiring a small voltage across said power supply circuit.

4,333,606

AIR INTAKE CONTROL SYSTEM IN AIR CONDITIONING SYSTEM

Yukio Shimada; Naoyoshi Suzuki; Toshio Ohashi, all of Yokohama, and Yasushi Inoshita, Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Nov. 6, 1980, Ser. No. 204,511
Claims priority, application Japan, Nov. 15, 1979, 54-147066
Int. Cl.³ B60H *1/00*
U.S. Cl. 237—12.3 A **9 Claims**

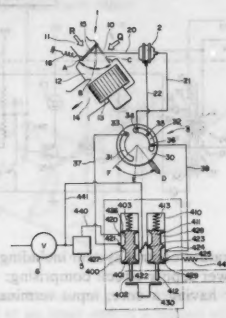
1. In an air conditioning system having an air intake system adapted to be switched between at least an outside air position and a recirculating air position, an air intake control system comprising:

(a) a pressure activated actuator adapted to switch said air intake system between said two positions;

(b) a mode selector having two inlets receiving a first control pressure and a second control pressure, and, adapted to supply selectively a plurality of different groupings of said first and second control pressures to said actuator;

(c) a first reference pressure source supplying a first reference pressure;

(d) a second reference pressure source supplying a second reference pressure;
(e) an air control switch receiving said first reference pressure source, adapted to output said first reference pressure when operated; and
(f) an air intake changeover switch receiving input pressures including the first reference pressure from said air control switch, and said first and second reference pressures from said first and second reference pressure sources, and



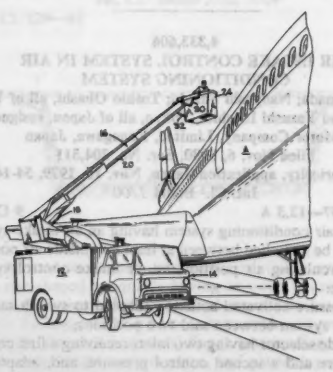
adapted, in a first position, to supply a first combination of said input pressures to said inlets of said mode selector; and adapted in a second position to supply a second combination of said input pressures to said inlets of said mode selector;
wherein said second combination is such that irrespective of the switching state of said mode selector, the groupings of said first and second control pressures supplied to said actuator is such that said actuator switches the air intake system to said recirculating air position.

4,333,607

PROPORTIONAL MIX SYSTEM AND METHOD FOR APPLYING A THIXOTROPIC DE-ICING FLUID TO AN AIRCRAFT

Wilfred Mueller, Oakland; Donald M. Ingham, Santa Clara, and William B. Walker, Los Gatos, all of Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Dec. 4, 1979, Ser. No. 100,173
Int. Cl.³ B05B *1/24*
U.S. Cl. 239—13 **26 Claims**



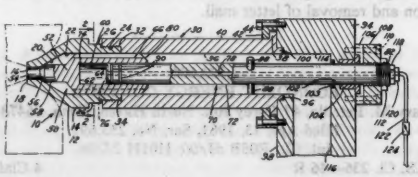
1. An apparatus for applying a de-icing fluid to a vehicle such as an aircraft; which apparatus includes a water tank and a water discharge system including a water pump, a water heater, and at least one discharge nozzle; a de-icing fluid tank and a de-icing fluid discharge system communicating with said nozzle and including a de-icing fluid pump; and power means for driving the pumps: the improvement which comprises clutch means interposed between said de-icing fluid pump and said power means, and control means included in at least one of said discharge systems for engaging said clutch in response to a flow of fluid through said discharge system at a rate in excess of a predetermined flow rate for subsequent discharge out of said nozzle, said one discharge system being said de-icing fluid discharge system, a de-icing fluid flow switch included in said control means for engaging said clutch and driving said de-icing fluid pump when the de-icing fluid flow through said de-icing fluid flow switch and one of said nozzles is above a predetermined value.

4,333,608

INJECTION MOLDING NOZZLE

James W. Hendry, Englewood, Tenn., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Sep. 19, 1980, Ser. No. 188,799
Int. Cl.³ B29F *1/03*
U.S. Cl. 239—118 **7 Claims**



1. An apparatus for controlling the flow of plasticized resin through a nozzle assembly comprising:
(a) a nozzle tip means attached to a nozzle body means, said body means affixed to a manifold means;
(b) passage means internal to said manifold means communication with a bore in said nozzle body means and in communication with bore in said nozzle tip means;
(c) plunger means internal to said nozzle assembly in cooperating engagement with said nozzle tip means;
(d) a control rod means, having a longitudinal bore therein, coacting with said plunger means and forming a chamber therein;
(e) said control rod means adjustably attached to said manifold means for controlling the displacement of said plunger means to vary the flow of plasticized resin;
(f) said plunger means is operated to an open position by a force developed by the resin acting on a differential area of said plunger and;
(g) said plunger is operated to a closed position by a force developed by fluid pressure in said chamber means.

4,333,609

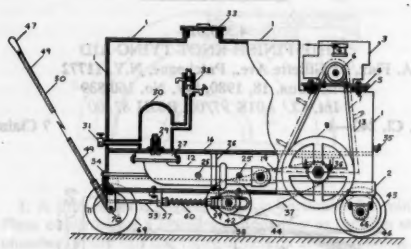
POWER PROPELLED RECIPROCATING PISTON PUMP LIQUID SPRAYER

Stevan Backo, 1884 Pillette Rd., Windsor, Ontario, Canada (N8T 1P1)

Filed Apr. 11, 1980, Ser. No. 139,191
Int. Cl.³ B05B *9/03*
U.S. Cl. 239—124 **12 Claims**

1. A power propelled reciprocating piston pump liquid sprayer comprising: a frame having front and rear cross members; a front axle being pivotally supported from the center of said front cross member and a rear axle supported from said rear cross member; a pair of wheels journalled on the opposite ends of the front axle and a pair of wheels journalled on the opposite ends of the rear axle; a steering handle connected to the front axle for moving the sprayer in the desired direction; a reservoir for holding the liquid to be sprayed mounted upon

said frame; a power unit mounted on top and to the rear of said reservoir; a first pulley connected to said power unit; a reciprocating piston pump mounted at the base of said frame; a crankshaft connected to said reciprocating piston pump; a second pulley connected to said crankshaft; a "V" belt trained over said first and second pulleys in order to operate said reciprocating piston pump; a valve housing secured to the base of said reservoir; inlet means to the reciprocating piston pump being located partly in said valve housing and partly in said reservoir, valve means in the form of a sliding rubber disc controlling the flow of liquid through said inlet means; outlet means from said reciprocating piston being located partly in said valve housing and partly in said reservoir and leading into a chamber means welded inside and to the base of said reservoir; a spring loaded ball valve controlling the flow of liquid through said outlet means; said chamber means completely enclosing the upper portion of said ball valve; an outlet tube attached to said chamber means and leading to the exterior of said reservoir; an adjustable pressure release valve attached to said chamber means for dumping excess liquid within said chamber means back into the reservoir; a chain drive sprocket secured to said crankshaft; a clutch shaft supported from said frame; a freewheeling clutch member associated with said



clutch shaft; a first sprocket being attached to said freewheeling clutch member; a sliding clutch member moving on said clutch shaft; a coil spring for forcing apart said sliding clutch member and said freewheeling clutch member disengaged; a second sprocket, this second sprocket being secured to said clutch shaft; a woodruff key upon said clutch shaft for guiding said sliding clutch member during back and forth movement of said sliding clutch member upon said clutch shaft; a third sprocket, this third sprocket being secured to the rear axle; a first chain means trained over said chain drive sprocket and said freewheeling clutch member; a second chain means trained over said second and third sprockets; and a manually controlled clutch operating lever connected by means of linkage means to a tapered clutch actuating fork for forcing said sliding clutch member into engagement with said freewheeling clutch member after overcoming the pressure exerted by said coil spring; whereby the motion transmitted by said power unit to said crankshaft is transmitted to said rear axle so as to propel the sprayer via said first chain means trained over said chain drive sprocket and said freewheeling clutch member, and via said second chain means trained over said second and third sprockets upon movement of said sliding clutch member into engagement with said freewheeling clutch member upon movement of said clutch operating lever by an operator.

4,333,610

GROOVED NOZZLE IRRIGATION SPRINKLER

Lloyd W. Clements, 49 W. Lincoln Ave. (C), Woodland, Calif. 95695

Continuation of Ser. No. 29,369, Apr. 11, 1979, abandoned. This application Jul. 10, 1980, Ser. No. 167,236

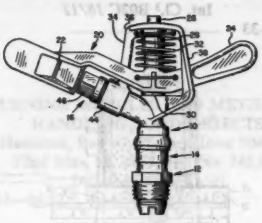
Int. Cl.³ A62C *31/02*

U.S. Cl. 239—601 **11 Claims**

1. In a sprinkler, a nozzle comprising:

a first portion having walls defining a generally frustoconical entrance passageway; and

a second portion having walls defining a generally cylindrical elongated discharge passageway in streamlined fluid communication with the entrance passageway, the discharge passageway terminating in an orifice at an effluent end of the nozzle, the length of the discharge passageway



being at least twice its diameter, the discharge passageway having a plurality of shallow longitudinal grooves in the walls thereof, the grooves being coextensive with the discharge passageway, the discharge passageway having a uniform transverse cross section of a predetermined area, the total cross-sectional area of the grooves being a small fraction of said predetermined area.

4,333,611

PROCESS FOR DECOMPOSING CELLS OF BIOMASSES OR THE LIKE

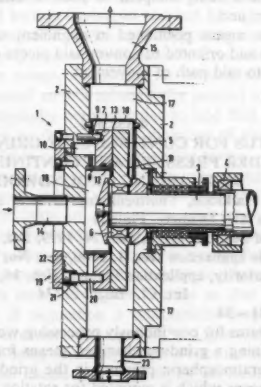
Friedrich J. Zucker, St. Andreasstrasse 16, D-4040 Neuss 21, Fed. Rep. of Germany; Georg Osthaus, Neuss, Fed. Rep. of Germany, and Doris Zucker-Kerbler, Vienna, Austria, assignors to Friedrich Josef Zucker, Neuss, Fed. Rep. of Germany

Filed May 2, 1980, Ser. No. 145,915

Claims priority, application Fed. Rep. of Germany, May 5, 1979, 2918212

Int. Cl.³ B02C *19/00*

U.S. Cl. 241—1 **7 Claims**



1. A process for decomposing cells of biomasses or the like or of substrates containing biomasses by heat and expansion, comprising passing said biomass through a gap between confronting surfaces of at least two elements, at least one of said elements moving with respect to the other of said elements at a sufficient speed and the width of said gap being sufficiently narrow to cause sudden heating of said biomass due to friction between said surfaces, and then directing said heated biomass from said gap into a chamber whereby the cells of said biomass

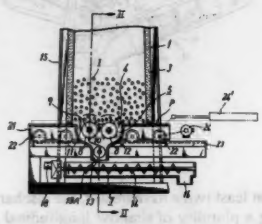
are caused to burst due to the vapor generated in said cells by said heat.

4,333,612

APPARATUS FOR STORAGE OF ICE

Takeshi Hayashi, Naruto, Japan, assignor to Kyoei Zoki Kabushiki Kaisha, Naruto, Japan

Filed Nov. 27, 1979, Ser. No. 98,018
Int. Cl.³ B02C *18/12*
U.S. Cl. 241—33 9 Claims



1. An apparatus for the storage and dispensing of ice, comprising:

a storage housing having upstanding sidewalls diverging in a direction from the top to the bottom thereof and adapted to store a quantity of ice therein;

insulation means insulating said upstanding sidewalls;

means defining a downwardly facing opening in a bottom part of said storage housing;

scratching-off means inside said storage housing and below said opening for breaking pieces of ice from said quantity of ice, said scratching-off means including at least two screw conveyors each rotatable about horizontal, coplanar and parallel axes, the screw blade of each screw conveyor effecting a horizontal conveyance of said pieces of ice along a path of movement in a direction parallel to said parallel axes;

outlet means located in said bottom part of said storage housing and oriented in alignment with said path of movement and being adapted to receive said pieces of ice therein; and

conveyor means positioned in alignment with said outlet means and oriented to convey said pieces of ice at a right angle to said path of movement.

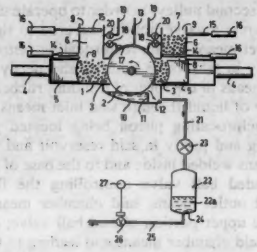
4,333,613

APPARATUS FOR CONTINUOUSLY GRINDING WOOD UNDER PRESSURE AND CONTINUOUSLY DISCHARGING GROUNDWOOD

Pekka O. Haikkala, Vuolteenkatu, Finland, assignor to Oy. Tampella AB, Tampere, Finland

Division of Ser. No. 6,156, Jan. 24, 1979, Pat. No. 4,274,600. This application Dec. 1, 1980, Ser. No. 211,867
Claims priority, application Finland, Feb. 16, 1978, 780514
Int. Cl.³ B02C *23/24*
U.S. Cl. 241—34 7 Claims

1. Apparatus for continuously processing wood, comprising means defining a grinding chamber, means for providing gas under superatmospheric pressure in the grinding chamber, a grinding means which is mounted for rotation in the grinding chamber, a device for feeding wood into the grinding chamber to form a primary groundwood stock therein, and a device for discharging the primary groundwood stock from the chamber without allowing gas to escape from the grinding chamber to atmosphere, the feeding device comprising a stationary feeding chamber provided with shutter means for sequentially pressure-tightly closing said feeding chamber from the atmosphere and from the grinding chamber respectively, thereby to prevent escape of gas from the grinding chamber through the feeding device, and the discharging device comprising a stick crusher for crushing sticks present in the primary groundwood stock thereby to produce a secondary groundwood stock, and means for receiving the secondary groundwood stock from the



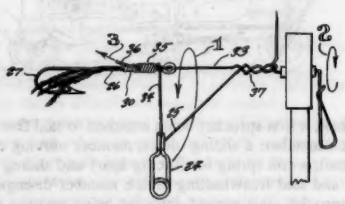
stick crusher and for continuously discharging the secondary groundwood stock while preserving a hydraulic seal of groundwood stock thereby to prevent escape of gas from the grinding chamber through the discharge device.

4,333,614

WHIP FINISH KNOT TYING AID

Eli A. Flax, 33 Gillette Ave., Patchogue, N.Y. 11772

Filed Jun. 18, 1980, Ser. No. 160,839
Int. Cl.³ A01K *97/00*; B65H *81/00*
U.S. Cl. 242—1 7 Claims



1. A fixture for aiding in whip-finishing a tying of an artificial fly on a fish hook, comprising, in combination, a supporting base for resting upon a surface, said supporting base having an upper face surface; an upright post extending perpendicularly from said upper face of said supporting post and affixed to said upper face; a sleeve telescopingly mounted about said post at the upper end of said post, said sleeve comprising a main elongated portion having a central aperture formed along the length thereof in which is received in sliding fashion the upper end of said post, a bushing mounted within said main elongated portion and traversing said central aperture along the width thereof, said bushing being positioned in said main elongated portion approximately midway between the ends thereof, said bushing resting on the uppermost portion of said upper end of said upright post so that a portion of said sleeve extends about said upper end of said upright post in telescoping fashion, and a portion of said sleeve extends upwardly from said upper end of said upright post, said bushing having a longitudinal axial passageway formed therethrough; and a crank means insertable through said sleeve and said bushing, said crank means comprising a horizontal leg portion which extends through said axial passageway in said bushing, a first vertical leg portion extending from one end of said horizontal leg portion and extending parallel with said central aperture of said sleeve, and a second vertical leg portion extending from the other end of said bushing and projecting in a direction opposite to said first leg portion, said second leg portion also extending parallel with said central aperture of said sleeve; said first leg portion

constituting a means for grasping to rotate said crank; and said second leg portion comprising a bent curved portion adjacent said other end of said bushing, and a straight elongated portion projecting from said bent curved portion at the portion thereof distant from said other end of said bushing, said bent curved portion of said second leg portion defining a catching area for loops of thread twisted during the tying of the fly to the hook shank, said bent portion holding said twisted loops thereon so that said crank may be rotated to thereby untwist said twisted loops.

4,333,615

FILM CASSETTE FOR ROLL FILMS

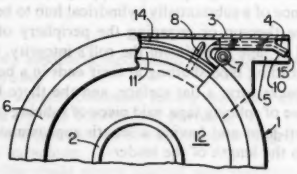
Achim Kluczynski, Overath, and Erik Altmann, Muelheim an der Ruhr, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Sep. 2, 1980, Ser. No. 183,055

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1979, 2935774

Int. Cl.³ G03B *1/04*

U.S. Cl. 242—71.1 **8 Claims**



1. A film cassette for roll films, in particular for miniature films, consisting of a cylindrical container as the film storage chamber, a film exit slot formed thereon and containing a film spool, at least one flange provided on the spool comprising on its outer circumference a conical collar wherein at least one edge of the cylindrical container is turned inwards to increase the impermeability to light of the film storage chamber and constructed so that the flange of the film spool is contained therein, the outer flange diameter of the spool and the inner wall of the container being positioned to hold the spool radially in position, and wherein the cassette slot comprises strips bent downwards at its lateral ends to define the width of the slot and in that at least one closure element is formed onto the cassette container overlapping the deformed container edge and laterally closing the cassette slot.

4,333,616

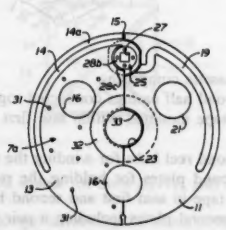
COLLAPSIBLE CORE PLATE CONSTRUCTION

Joseph Strouse, c/o Strouse Industries, Inc., 8090 Danbury Dr., Mentor, Ohio 44060

Filed Sep. 19, 1980, Ser. No. 188,864

Int. Cl.³ B65H *75/18*

U.S. Cl. 242—72 R **8 Claims**



1. Recoiler mechanism including a core plate of relatively thin material having a main body and complementary arcuate portions of like thinness providing a part of the peripheral surface of the core plate, said portions being integrally connected with the body, forming with the body, a flexible surface about which material may be coiled, the arcuate portions terminating in adjacent free ends, and means intermediate the free ends, to effect expandible and subsequent collapsible movement of at least part of the portions to enable removal of material coiled about the surface.

4,333,617

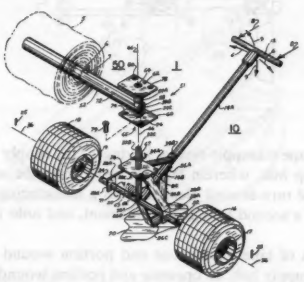
PIN-TURNING ARTICLES AND METHODS, FOR HANDLING LOAD OBJECTS

Martin B. Hamilton, Box 97, Wesley, Iowa 50483

Filed Mar. 18, 1981, Ser. No. 245,083

Int. Cl.³ B65H *75/40*

U.S. Cl. 242—86.52 **18 Claims**



1. Load handling apparatus for handling a load body, said load handling apparatus comprising

transporting means comprising body means and means mounted to said body means for permitting said body means to move along a surface;

said body means comprising lifting pin means having an elongated section having an end and having a first direction of elongation, first weight supporting means mounted on said body means in substantially fixed relation to said lifting pin means, and means for turning said lifting pin means around an axis substantially parallel to the surface and substantially perpendicular to said first direction of elongation so that said first direction of elongation and said axis lie in a common geometric plane;

said load handling apparatus further comprising lift member means having at least a second elongated section having a second direction of elongation, said second elongated section being shaped so as to be attachable slidably to said load body, and said lift member means further having receptacle means for pivotably and slidably receiving said lifting pin means elongated section so that said second direction of elongation is substantially perpendicular to said first direction of elongation, said first weight supporting means being pivotably supportive of the weight of said lift member means when said lifting pin means is inserted into said receptacle means;

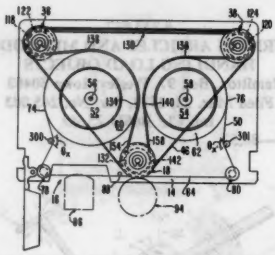
said transporting means being orientable so that said axis is substantially parallel to said second direction of elongation, and said lifting pin means by said turning around said axis permitting lifting of said lift member means and said load body, said load handling apparatus thereby being able to lift and transport and thereby handle said load body, when said lift member means is slidably attached to said load body and said lifting pin means is received into said lift member means.

4,333,618

APPARATUS FOR REDUCING TAPE TENSION VARIATIONS IN A PERIPHERAL BELT DRIVE TAPE TRANSPORT SYSTEM

William E. Seaman, Woodside, Calif., assignor to Newell Research Corporation, Saratoga, Calif.

Filed Jun. 24, 1980, Ser. No. 162,598
Int. Cl.³ G03B 1/04; G11B 15/32
U.S. Cl. 242—192 7 Claims



1. In a tape transport system having a tape supply hub and a tape takeup hub, wherein tape is drawn from the supply hub over a first turn-around element, past a transducing head station, over a second turn-around element, and onto the takeup hub;

a length of tape having one end portion wound about the tape supply hub, an opposite end portion wound about the tape takeup hub, and an intermediate portion of tape extending between the hubs;

an endless drive belt loop having a stiffness which is at least approximately equal to that of the tape stiffness, said drive belt engaging the periphery of tape wound upon the supply hub and the takeup hub for driving the tape-wound hubs to thereby transfer tape from one hub to the other hub and for establishing a tension on the intermediate portion of tape;

said first and second tape guide turn-around elements being positioned so as to support a head-span of tape to thereby guide the intermediate portion of tape past the transducing head station as the tape is transferred from one of the hubs to the other one of the hubs, the improvement comprising:

a first fixed friction post located in said tape path, between said turn-around element and said supply roll,

said first post being located so as to be in constant contact with the tape as it spools off of said supply hub, the tape describing a minimum angle of wrap around said post when a minimum amount of tape is wound upon said hub, and a maximum angle of wrap around said post when a maximum amount of tape is wound upon said hub, said minimum angle being an angle greater than zero degrees, sufficient to prevent the frictional drag between the tape and post surfaces from falling to zero;

and a second fixed friction post located in said tape path, between said second turn-around idler and said takeup roll,

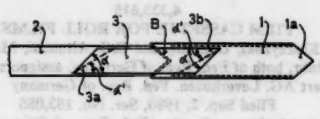
said second post being located so as to be in constant contact with the tape as it spools onto said takeup hub, the tape describing a minimum angle of wrap around said post when a minimum amount of tape is wound upon said hub, and a maximum angle of wrap around said post when a maximum amount of tape is wound upon said hub, said minimum angle being an angle greater than zero degrees, sufficient to prevent the frictional drag between the tape and post surfaces from falling to zero.

4,333,619

RECORDING MEDIUM AND LEADER ASSEMBLY

Klaus Schoettle, Heidelberg, and Lothar Gliniorz, Frankenthal, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 24, 1980, Ser. No. 143,487
Claims priority, application Fed. Rep. of Germany, May 2, 1979, 2917709
Int. Cl.³ G03B 1/04; G03C 1/76
U.S. Cl. 242—195 12 Claims



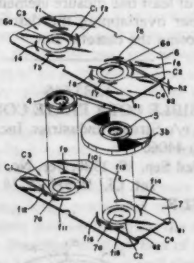
1. A recording tape, in particular a magnetic tape, having at least one self-threading leader and adapted to form a supply or take-up roll, the leader having adhesive means which join the leader to the recording tape and wrapping smoothly onto the circumference of a substantially cylindrical hub to begin winding the tape thereon or engaging the periphery of the fully wound roll of tape to maintain the roll's integrity, the leader and the recording tape abutting at their ends in a butt-joint so that their backs form a flat surface, and the there being provided a piece of splicing tape, said piece of splicing tape covering said butt-joint and having a length approximately corresponding to the length of the leader.

4,333,620

TAPE CASSETTE

Toshihiko Ishida, and Kimio Tanaka, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1980, Ser. No. 131,817
Claims priority, application Japan, Mar. 19, 1979, 54-35449[U]
Int. Cl.³ G03B 1/04; G11B 15/32
U.S. Cl. 242—199 4 Claims



1. A tape cassette comprising:

first and second half casings connected together;

a magnetic tape mounted within said first and second half casings;

first and second reel hubs for winding the magnetic tape;

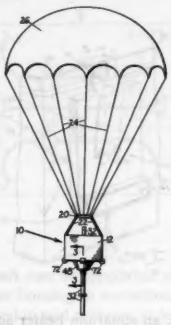
first and second plates for holding the reel hubs and the magnetic tape in said first and second half casings, said first and second plates including a pair of bent portions defining portions in contact with the reel hubs, said bent portions having a plurality of cut portions extending therethrough which surround said first and second reel hubs.

4,333,621

SHOCK ABSORBING MECHANISM FOR A PARACHUTE SUPPORTED LOAD

Otto H. Acker, P.O. Box 2, Washougal, Wash. 98671

Filed Apr. 30, 1979, Ser. No. 34,288
Int. Cl.³ B64D 1/14
U.S. Cl. 244—138 R 5 Claims



1. A shock absorbing mechanism for a parachute supported load comprising

(a) a load support container having enclosing sides and also having top and bottom wall portions,

(b) connecting means on said container arranged to connect it to a parachute,

(c) tube-like guide means integral with said container,

(d) said guide means being disposed in a central portion of said container and opening through said top and bottom wall portions,

(e) a landing rod slidable in said guide means,

(f) and friction brake means operating between said landing rod and said guide means,

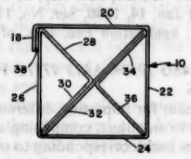
(g) said landing rod being of a sufficient length to project beyond the lower end of said container whereby said landing rod in a parachute landing of said container engages the ground prior to the container and frictionally slides upwardly through said container in said guide means for cushioning the landing shock of said support means.

4,333,622

KNOCKDOWN SPACER FOR BOOKSHELVES AND THE LIKE

Robert N. Albano, 1844 S. Butler Ave. #4, Los Angeles, Calif. 90025

Filed Apr. 30, 1980, Ser. No. 144,979
Int. Cl.³ A47B 91/00; F16M 11/20
U.S. Cl. 248—188.8 3 Claims



1. A knockdown spacer for bookshelves and the like, comprising:

a single piece elongated rectangular blank of flat sheet material having opposed longitudinal edges;

said blank having creases extending perpendicularly between said edges, the creases being spaced to divide the blank into a continuous succession of wall elements arranged to be folded and define an open ended box of generally rectangular cross section with exterior side walls and interior cruciform diagonal walls extending between opposite corners of the box;

a single end of said blank having a retaining flap thereon for overlapping a portion of one of said side walls in the box configuration;

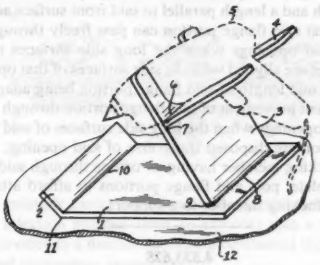
and retaining means including fasteners having interengaging elements on said flap and the overlapped side wall portion.

4,333,623

GLUE GUN HOLDER

Walder C. May, 84 S. 100 E., St. George, Utah 84770

Filed Mar. 31, 1980, Ser. No. 135,894
Int. Cl.³ F16M 11/00
U.S. Cl. 248—176 2 Claims



1. A holder for a glue gun or the like made by welding together four steel plates comprising a flat base plate, a second inclined plate welded to one end of said base plate, a third plate welded to the base plate and extending at an angle thereto in the direction of the inclined plate and a fourth plate welded perpendicularly to the third plate and extending at an angle to said third plate toward said inclined plate, said third and fourth plates each having a recess formed in the end thereof opposite the weld thereby forming a cradle for receiving a glue gun above said base plate so that any glue dripping from the glue gun will fall on the base plate, said inclined plate forming a shield to prevent glue from running off the base plate in a forward direction and to prevent loose objects on a surface on which the base plate rests from coming into contact with any glue on said base plate.

4,333,624

HANGER ASSEMBLY

John A. Raddatz, South St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 15, 1979, Ser. No. 85,043
Int. Cl.³ F16M 13/00
U.S. Cl. 248—205 R 11 Claims

1. A hanger assembly comprising:

a stiff, flexible, resilient polymeric strap having a plurality of through openings spaced along its length, each of said openings being partially defined by opposed, generally parallel side surfaces defining the longest dimension and width of said opening, said side surfaces being disposed generally parallel to and equally spaced from the adjacent edges of said strap; and

a rigid locking member comprising:

a backing plate portion having length and width dimensions along a front surface precluding the movement of said backing plate portion through one of said openings in a direction normal to said front surface;

a post portion projecting from said backing plate normal to said front surface and being adapted to be received between the side surfaces of said openings; and

an elongate flange portion transverse of and centrally affixed on the end of said post portion opposite said backing plate portion, said flange portion having a width and a length parallel to said front surface adapted so that said flange portion can pass freely through one of said openings when the long side surfaces of said flange are aligned with the side surfaces of that opening, with said length of said flange portion being adapted to prevent movement of said flange portion through one of said openings when the long side surfaces of said flange portion are disposed transverse of said opening;

said locking member having an orifice through said backing plate, post and flange portions to afford attaching said locking member to a support.

4,333,625

WALL HANGER HOOKS

Richard Haug, P.O. Box 115, Lake Grove, N.Y. 11755

Continuation of Ser. No. 11,842, Feb. 13, 1979, abandoned. This application Feb. 21, 1980, Ser. No. 123,360

Int. Cl.³ E04G *3/00*

U.S. Cl. 248—216.1 **1 Claim**

1. A wall hanger hook comprising a substantially flat face plate having an upper edge and a lower edge, a first side edge, and a second side edge; an elongated straight prong extending from said upper edge of said face plate at an acute angle thereof relative to the plane containing the front surface of said flat face plate such that the end of said prong remote from said upper edge projects downwardly toward said lower edge from said upper edge, said prong having a tapered cross-section such that said remote end of said prong terminates substantially in a point, said prong further having a plurality of serrations formed across the width thereof for anchoring said prong in a wall; and a first pair of hook members extending from said lower edge of said flat face plate, and a second pair of hook members extending from the side edges of said flat face plate, one of said second pair extending from said first side edge and the other extending from said second side edge, said second pair of hook members being spaced from each other across the width of said plate a greater distance than said first pair of hook members, and said second pair of hook members being positioned closer to said upper edge of said plate than said first pair of hook members, said flat face plate being of substantially rectangular cross-section and having a cut-out portion formed therein also of substantially rectangular cross-section.

4,333,626

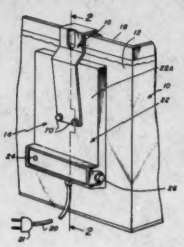
AQUARIUM HEATER

Arthur J. Holbrook, Lynnfield, Mass., assignor to Rolf C. Hagen (USA) Corp., Mansfield, Mass.

Division of Ser. No. 949,436, Oct. 10, 1978, Pat. No. 4,313,048. This application Nov. 2, 1979, Ser. No. 90,674

Int. Cl.³ A47G *29/00*

U.S. Cl. 248—360 **8 Claims**



1. In combination, an aquarium heater and a holder for the aquarium heater for mounting the heater against an outer surface of a side wall of an aquarium tank, said aquarium heater comprising an insulated housing, heat transfer plate means and means for selectively coupling electrically-generated heat to the heat transfer plate means from which the heat is coupled through the aquarium tank side wall to the water in the aquarium tank, said heater housing having a thickness less than its width and height and having an outer planar surface extending substantially in parallel with the aquarium tank side wall, said holder comprising an elongated member having a top flange for contacting a top edge of the tank side wall, top securing means connected to the top flange for securing on the inside of the side wall maintained the top end of the elongated member in a fixed position relative to the tank side wall, and a lower depending leg means extending from the top flange and at least partially outwardly of the tank side wall and housing outer planar surface, said lower depending leg means including top and bottom leg walls, said top leg wall coupled to said top flange and the top and bottom leg walls commonly interconnecting to form an angle therebetween less than 180°, said bottom leg wall having means for securing the depending leg means to the outer planar surface of the housing, said leg means arranged to provide a biasing force in a direction normal to the outer planar surface of the housing to maintain the heater heat transfer plate means in intimate contact with the outer surface of the side wall of the aquarium tank.

4,333,627

ARRANGEMENT FOR MOVING AN OBJECT

Walter Dembinski, Schweinfurt, and Karl-Joachim Kühne, Niederwerrn, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Jan. 14, 1980, Ser. No. 112,717

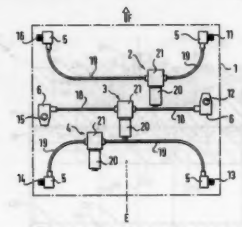
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1979, 2903782

Int. Cl.³ A45D *19/04;* A47J *47/16;* F16M *16/00*

U.S. Cl. 248—396 **29 Claims**

1. An arrangement for imparting different adjustable directional movements to an object, comprising a number of adjusting gear assemblies each corresponding to one of said different adjustable directional movements and including a gear housing, a worm gear having an axis and supported in said gear housing for rotation about the axis of said worm gear, motion transmitting means for connecting said worm gear to the object to adjustably move the object when said worm gear is driven by said worm, a worm arranged for rotation in said gear housing in meshed engagement with said worm gear for driving said worm gear, drive means including a worm shaft for driving said worm, a number of worm shaft bearing inserts

removably mounted in said gear housing for supporting said worm shaft, seating means including recesses formed in said gear housing for seating said worm shaft bearing inserts wherein each of said recesses is arranged to seat a selected one of a number of differently shaped worm shaft bearing inserts so



that said worm shaft can be supported at a desired position relative to said gear housing in accordance with the selected bearing inserts seated in said recesses, at least some of the gear housings of said adjusting gear assemblies being constructed substantially identically to one another.

4,333,628

PERFORATED BOARD DISPLAY BRACKET ASSEMBLY

Robert C. Geisler, Addison, Ill., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.

Filed Jul. 9, 1980, Ser. No. 167,032
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—551 **3 Claims**

1. An improved perforated board display assembly comprising, in combination:

a perforated board having an array of perforated board openings for receipt of a hanger member;

a hanger member comprised of a flexible U-shaped rod having generally parallel, spaced legs connected by a crown section, the legs each terminating in a double bend which projects through the perforated board openings to define parallel runs on each side of the perforated board, said legs having extended elastic runs connected to the crown section; and

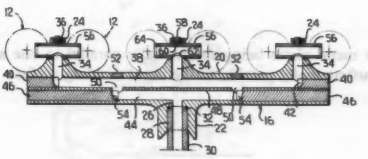
a display board comprising a planar detent panel conforming in general to the shape and size between the legs and crown section, a second display panel extending over the planar detent panel and facing one side of the planar detent panel and hanger member, and a cross bar member affixed on the opposite side of the planar detent panel and projecting over a portion of the extended elastic runs of the legs whereby the display board is positioned and retained on the hanger member which, in turn, is engaged with the perforated board, said display board being removed by elastically deflecting the legs of the hanger member to permit slidable removal of the display board planar detent panel from engagement with the hanger member.

4,333,629

FLOATING MANIFOLD FOR MULTI-CAVITY INJECTION MOLD

Siegfried S. Roy, Amherst, N.H., assignor to Pepsico, Inc., Purchase, N.Y.

Filed Mar. 11, 1980, Ser. No. 129,442
Int. Cl.³ B29F *1/03*
U.S. Cl. 249—119 **6 Claims**



1. A multiple cavity injection mold assembly wherein material is injection molded from an extruder into a plurality of mold cavities in a manner involving substantial thermal gradients and expansions, comprising:

a. a supply tube, extending in a transverse direction, for supplying molding material from an extruder to the plurality of mold cavities;

b. a plurality of mold cavities having inlet passageways extending in a longitudinal direction, substantially orthogonal to said transverse direction; and

c. a floating manifold positioned between said supply tube and said inlet passageways to the plurality of mold cavities and designed to accommodate thermal expansions in both said transverse and longitudinal directions, said manifold having an inlet passageway extending in said transverse direction and being in telescoped relation with said supply tube and further having exit passageways extending in said longitudinal direction and being in telescoped relation with said inlet passageways to said plurality of mold cavities, whereby the telescoped relations in both the transverse and longitudinal directions allow the manifold to positionally float to accommodate thermal expansions in both directions.

4,333,630

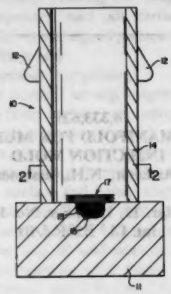
MOLD BOTTOM AND STOOL PROTECTOR CONSTRUCTION

Robert R. Strange, 522 Lynnview Dr., Sagamore Hills, Ohio 44067

Filed Nov. 14, 1980, Ser. No. 207,029
Int. Cl.³ B22D *7/06, 7/12*
U.S. Cl. 249—135 **8 Claims**

1. In combination, an ingot mold including a bottom having an ingot molding surface and including an eroded cavity defined therein and filled with particulate material, and a laminated plate assembly covering said filled cavity and comprising at least two spaced-apart metal plates secured together at laterally spaced points, the thickness of each plate being be-

tween about 0.070 and 0.250 inches, and the spacing between the plates being between 0.0625 and 0.50 inches, the spaced-



apart metal plates being substantially parallel to one another and substantially parallel to the ingot molding surface.

4,333,631

PIPE VALVE ASSEMBLY WITH METAL VALVE SLIDE FOR HIGH VACUUM INSTALLATIONS

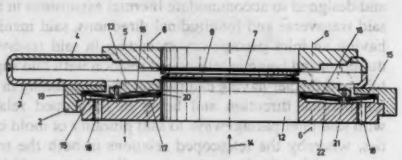
Hubert Bösch, Lustenau, Austria, assignor to Vat Aktiengesellschaft für Vakuum-Apparate-Technik, Haag, Switzerland

Filed Nov. 17, 1980, Ser. No. 207,425

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1979, 2947517

Int. Cl.³ F16K *25/00*

U.S. Cl. 251—159 **4 Claims**



1. A pipe valve assembly particularly for controlling flow in pipes for high vacuum installations comprising: a housing defining a flow aperture, a valve member adapted to be moved between a first position for closing said aperture and a second position for opening said aperture, a valve seat ring arranged coaxially with said aperture and adapted to be moved axially relative thereto to a sealing position to press said valve member against said housing to seal said aperture when said valve member is in said first position, spring means engaging said valve seat member to urge said valve seat member away from said sealing position, and fluid pressure means including means defining together with said spring means a fluid pressure chamber on one side of said spring means for urging said valve seat ring into said sealing position, said spring means comprising a smaller diameter annular spring member and a larger diameter annular spring member arranged coaxially relative to each other and relative to said valve seat ring, with said valve seat ring being attached with the outer edge of said smaller diameter spring member and the inner edge of said larger diameter spring member, said spring means being supported in said housing at an inner edge of said smaller diameter spring member and at an outer edge of said larger diameter spring member.

4,333,632

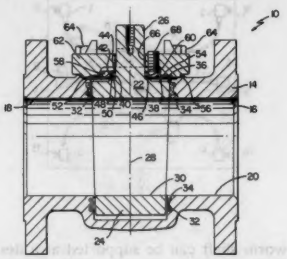
LIP SEAL

Russell G. Smith, Cincinnati, Ohio, assignor to Xomox Corporation, Cincinnati, Ohio

Filed Jan. 7, 1981, Ser. No. 223,126

Int. Cl.³ F16K *5/02*

U.S. Cl. 251—214 **5 Claims**



1. A valve with an improved top seal, comprising:

(a) a valve body having an internal flow passage extending therethrough;

(b) a valving member rotatably fitted in said valve body for controlling fluid flow through the internal flow passage, said valving member being rotatable about an axis and having a plug portion interposed in said internal flow passage with a passageway which is selectively movable in and out of registry with said internal flow passage in accordance with the valving member rotational position with respect to said valve body, said valving member having a shaft portion joined to said plug portion for transmitting torque to said plug portion from a location remote from said plug portion and a shoulder on said valving member intermediate said shaft and plug portion;

(c) a diaphragm sealingly fitted to said valve body and having a central opening through which said shaft portion of said valving member extends, said diaphragm having a hollow groove of predetermined cross-sectional shape proximal to said central opening, said hollow groove having sidewalls extending in the direction of said axis said sidewalls being convergent in a direction toward said remote location with one of the sidewalls engaging said stem portion of the valving member; and

(d) a circular seal fitted within said hollow groove and having a cross-sectional configuration matching that of the groove, said circular seal bearing against and in sealing relationship to said shoulder and being operative to radially urge said sidewalls of said one of the groove in said diaphragm against said stem portion of the valving member.

4,333,633

PNEUMATIC SENSOR

Casimir M. Guzay, Hoffman Estates, and James A. Wright, Chicago, both of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Filed May 22, 1980, Ser. No. 152,276

Int. Cl.³ F16K *1/00*

U.S. Cl. 251—320 **3 Claims**

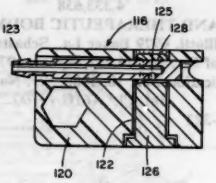
1. A pneumatic sensor for connection to the sensor port of a bleed-pressure piloted valve and resonsive to engagement by an article the presence of which is to be detected to block air from escaping said sensor port, said sensor comprising:

a body having a bore;

a target slightly smaller than said bore disposed in said bore and having an aperture the axis of which extends transversely to that of said bore;

a tube connected to said sensing port and slightly smaller than said aperture extending through said body and into

said aperture, said tube having an opening disposed in said aperture and extending generally toward the end of the target to be engaged by said article, said target being movable between an extended position and a retracted position in which said target blocks said opening, air pressure biasing said target to its extended position and the



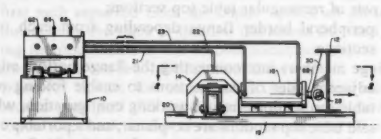
surface of said target defining said aperture being arcuate whereby, when said target is in its extended position, air escaping from said tube opening undergoes annular flow causing a pressure balance on the surface defining said target opening so that said target is movable from its extended position by very low force.

4,333,634

GRIPPER ASSEMBLY FOR MOVING DRILLING RIGS

Fred H. Malzacher, 5530 Rushmore St., Ventura, Calif. 93003

Filed Apr. 8, 1980, Ser. No. 138,329
Int. Cl.³ B66F *1/00*
U.S. Cl. 254—106 **10 Claims**



1. A gripping assembly for moving drilling rigs supported on a flanged skid base of a drilling platform comprising:

a support frame comprised of a platform joining end plates resting on the flanges of said skid base;

a cross-member traversing said support frame having cantilevered shoulder extensions extending outboard of the flanges of said skid base;

gripper connecting arms pivotally mounted on said shoulder extensions having gripping flanges adapted to press against the underside of said skid base flanges;

clamping load expansion hydraulic means for applying a force to said gripper connecting arms whereby said arms apply a clamping force on said skid base flanges between the edges of said end plates and said connecting arm gripper flanges;

hydraulic jack means connecting said support frame to said drilling rig for moving said drilling rig while said gripper assembly is clamped to the flanges of said skid base.

4,333,635

FOLLOW-UP CONTROL MEANS IN SWINGING-ARM FLAME-CUTTING MACHINES

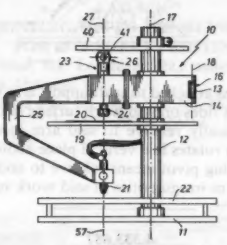
Anton Koukal, Pfarrstrasse 6, 7326 Heiningen, Fed. Rep. of Germany

Filed Nov. 26, 1979, Ser. No. 97,121
Int. Cl.³ B23K *7/10*
U.S. Cl. 266—64 **6 Claims**

1. Follow-up control means in swinging-arm flame-cutting machines comprising a scanning element which is arranged at the outer component arm of the swinging arm carrying the cutting torch, and in coaxial relation to the latter and which is advanced by drive means likewise arranged on the outer component arm to follow automatically the contour of a pattern having the configuration of a part to be cut from a workpiece, characterized by the following features:

(a) the scanning element comprises a photo-electric scanning head (24) which together with the feeding means (26) forms an assembly (23) seated at the outer guide rod (14) of the swinging-arm (16) for rotation about the torch axis (57, 27);

(b) the feeding means (26) comprises a feed wheel (39) which is driven by a feed motor (36) and which rides on an end plate (40) fixed to the frame of the flame-cutting machine (10, 60) which extends in parallel to the supporting surface (19) for the pattern (20) and to the plane of movement of the torch (21), respectively the point of contact (42) between the feed wheel (39) and the said end plate being arranged at the point where the torch axis (57, 27) projects through the contact surface (43) of the end plate (40), and the center plane of the said feed wheel (39) which com-



prises the torch axis (57, 27) extending perpendicularly to its axis of rotation (41);

(c) the scanning head (24) comprises a conventional arrangement of photo-electric detectors picking up the directional changes of the contour of the pattern and generating a control signal characteristic of any deviation of the contour of the pattern (20) from the momentary feeding direction, which signal is supplied to a swivel control motor (33) which, in response to the said control signal, rotates the scanning head (24) together with the drive means (26) into the orientation conforming to the contour of the pattern;

(d) the pattern (20) is arranged in a plane extending between the scanning head (24) and the workpiece and in parallel to the latter and to the end plate (40), and the torch (21) is connected with the outer guide arm (14) by means of a U-shaped arm (24) encompassing the pattern (20) at a certain distance.

4,333,636

CUTTING-TORCH HOLDER

Joseph A. Wajtkowicz, Pasadena, Md., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Dec. 10, 1980, Ser. No. 215,192
Int. Cl.³ B23K *7/10*
U.S. Cl. 266—68 **1 Claim**

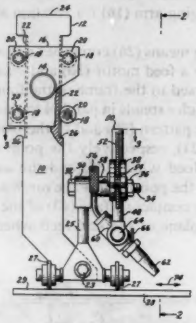
1. Apparatus adapted to automatically maintain flame cutting means a predetermined distance from a work surface as the flame cutting means moves relative to a work surface comprising:

(a) a slide member having its upper end slidably attached for vertical movement to an arm member and its lower end pivotally attached to a support arm by horizontally extending pivot means so that said support arm is adapted to rotate about said pivot means in a substantially vertical plane,

(b) holder means attached to said support arm for securing said flame cutting means to said support arm,

(c) said holder means comprising an L-shaped member hav-

ing integral rack means on its vertical leg in mating contact with pinion means on said support arm for vertically adjusting said flame cutting means and pivot means on its horizontal leg for adjusting the angle at which the flame cutting means impacts the work surface, and



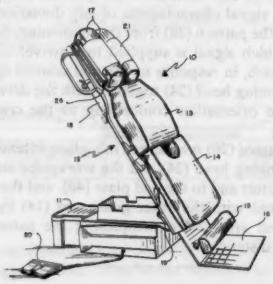
(d) roller means attached to said support arm whereby as the roller means rides on said work surface said slide member moves vertically relative to said arm member and said support arm rotates in a vertical plane about said horizontally extending pivot means relative to said slide member in response to irregularities in said work surface.

4,333,637

CHIROPRACTIC TABLE WITH PAPER RETAINER

Robert B. Shelton, 726 W. 600 South, Brigham City, Utah 84302

Filed May 19, 1980, Ser. No. 151,117
Int. Cl.³ A61G *13/00*
U.S. Cl. 269—322 **15 Claims**



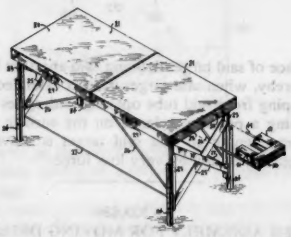
1. A chiropractic table assembly having a floor contacting base; a table member secured to the base, the upper surface thereof being adapted for a patient to pronely rest cushioned thereon; a rolled strip supply of disposable sanitary paper secured to the table member, a free end portion thereof changeably covering the face supporting portion of the upper surface; and a paper retainer comprising: an elongate retainer base secured to the table member and having an outwardly facing elongate surface extending at least the width of the paper strip transversely; an elongate paper clamping member with an inwardly disposed surface portion thereof in general matching relationship with the elongate surface of the retainer base; and spring means urging said member toward contact with said surface of the base, so that the free end of the paper strip is clamped therebetween; and wherein the paper clamping member has a pair of parallel bores, a one therethrough near each of its ends; and the spring means comprises: a pair of studs of generally smaller diameter than the bores, each having an enlarged end portion, and each being disposed in general axial alignment with a one of the bores and secured rigidly at its smaller end to and outstanding normally from the paper retainer base; and a compression coil spring disposed about each of the studs and acting between the enlarged end thereof and the clamping member urging it to clamp the paper against the paper retainer base.

4,333,638

MASSAGE AND THERAPEUTIC BODY WORK TABLE

Michael A. Gillotti, 6979 Baker La., Sebastapol, Calif. 95472

Continuation of Ser. No. 26,822, Apr. 4, 1979, abandoned. This application Dec. 10, 1980, Ser. No. 215,121
Int. Cl.³ A61G *13/00*
U.S. Cl. 269—322 **6 Claims**



1. A portable, folding massage table to be subjected to forces parallel to the surface thereof as well as vertical loading comprising:

a pair of rectangular table top sections;

a peripheral border flange depending from each of said sections;

hinge members interconnecting the flange bottom edges of adjacent sides of said sections to enable folding of said table top sections from a working configuration, wherein said table top sections are co-planar, and a portable configuration, wherein the bottom edges of said flanges are juxtaposed;

two pairs of support legs of rectangular cross section;

hinge means securing facing sides of each pair of legs to the underside of a table top section near the outer edge thereof to fold toward said hinge members into the receptacle formed by said border flange;

a pair of rigid, diagonal cross braces secured between the legs of each pair thereof;

a pair of flexible, non-stretchable cables, one of said cables being secured between each leg of a pair thereof and the opposing leg of the other pair thereof, each said cable being of nearly the combined lengths of said table top sections so as to be under tension when said sections are in working configuration, and being secured at opposite ends thereof to opposing legs near the bottoms thereof to prevent separation thereof;

a pair of rigid rods removably connected between the inner surface of each of said adjacent flanges near the ends thereof to said facing sides of the pair of legs carried on the same table top section to prevent inward movement thereof;

an extension for each of said legs;

a row of through holes along the length of each of said extensions;

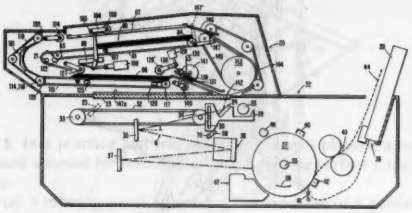
a pair of spaced threaded members secured to each of said legs to extend from a lateral side thereof, said threaded members being receivable in a pair of said holes aligned therewith; and

complementary tongue and groove slide means formed in said lateral side and a side of said extension containing said row of through holes.

4,333,639
RECIRCULATING DOCUMENT FEED FOR ELECTROPHOTOGRAPHIC APPARATUS

Ronald V. Davidge, Boulder; Carl A. Queener, Lyons, both of Colo., and James T. Vanderslice, Wilton, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 27, 1980, Ser. No. 181,574
Int. Cl.³ B65H 5/22
U.S. Cl. 271—3.1 4 Claims

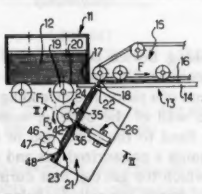


1. A copier, including:
copier optics for scanning documents to be copied;
a first document tray for holding a stack of original documents with all their faces, carrying matter to be copied, oriented in a first direction;
a second document tray for receiving the stack of original documents with all their faces, carrying matter to be copied, oriented in a second direction;
means for substantially simultaneously transferring, along a first path removed from the copier optics, all the documents from the stack in the first document tray and placing the documents in the second document tray to form the stack in the second document tray; and
a transport device for sequentially transferring, along a second path past the copier optics, documents from the top of the stack in the second document tray to reconstruct the stack of original documents in the first document tray.

4,333,640
AUTOMATIC DOCUMENT PROCESSING MACHINE

Jacky F. A. Miller, Paris, France, assignor to Compagnie Internationale pour l'Informatique CII Honeywell Bull (Societe Anonyme), Paris, France

Filed Dec. 18, 1979, Ser. No. 104,858
Claims priority, application France, Dec. 28, 1978, 78 36795
Int. Cl.³ B65H 3/44
U.S. Cl. 271—9 16 Claims

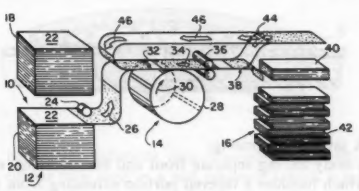


1. An automatic document processing machine comprising a loading magazine containing a stack of documents and provided with a throat though which said documents can be extracted one-by-one from said magazine, feeding means for controlling the extraction of said stacked documents, one-by-one, through said throat, a guide track provided with at least one processing station adapted for treating only one document at a time, said track having a document entry situated close to said throat and in line with said throat, and unit insertion means for inserting another single document which includes an exit for documents, a drive means disposed to come into contact with said another document in the said support means arranged to feed the said another document to the said exit, and an engaging means adapted to produce relative movement between the said support means and the said drive means, said support means having its exit disposed adjacent to the throat of said loading magazine and to the document entry of said guide track, and arranged so that said exit is in line with said document entry at least when the said engaging means is actuated at an instant different from that at which said feeding means is actuated and wherein said support means comprises two plates, a spacer between one end of each of said plates for spacing said plates away from one another and forming an internal cavity therebetween, a pivot hinge, said support means being mounted to said pivot hinge to pivot relative to the said drive means upon actuation of said engaging means.

4,333,641
DUPLEX PRINTING/PAPER HANDLING APPARATUS FOR CUT SHEET PRINTING

Emmett B. Peter, III, Leesburg, Fla., assignor to Burroughs Corporation, Orlando, Fla.

Filed Jun. 26, 1980, Ser. No. 163,394
Int. Cl.³ B65H 29/58
U.S. Cl. 271—289 6 Claims



1. Paper handling apparatus for selectively diverting cut sheet and similar type items from a single input pathway into a selected one of a number of output pathways comprising,
a modular structural support member including a plurality of diverging pathways,
a first set of diverter means,
a second set of diverter means,
flexible means coupling said first and second set of diverter means for conjoint operation,
electromagnetic means operably coupled to said flexible coupling means for causing said diverter means to move so as to block and unblock the pathway of cut sheet items fed therepast, and
one-way gate means operably associated with said first and second diverter means permitting a selected sheet item to pass said one way gate means and enter one of said item diverting pathways without return.

4,333,642
TOY

Andrea V. Adams, Rte. #1, Box 378, Bentonville, Ark. 72712

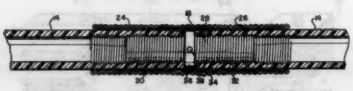
Filed Jul. 23, 1980, Ser. No. 171,446
Int. Cl.³ A63G 31/00
U.S. Cl. 272—1 D 20 Claims

20. In a toy to be worn by a person for play and ornamentation and including a substantially hollow body member open at the bottom and having a central opening therethrough that is large enough to receive the body of the person wearing the toy, the improvement comprising a stabilizing strap member extending lengthwise across the inside of the body member in spaced relationship below the central opening for extending between the legs of a person wearing the toy, said strap having its opposite end portions connected respectively to said body

member adjacent opposite ends thereof and being relatively tightly drawn so as to stabilize the position of the body member

on the person wearing the toy and to facilitate control to coordinate movements of the body member to movements of said person wearing the toy.

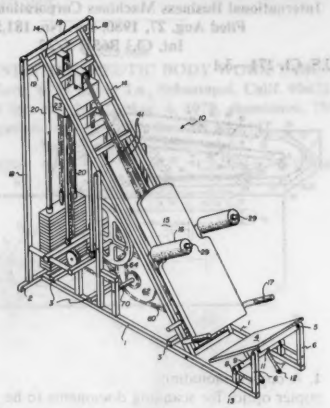
4,333,643
JAVELIN
Victor Saffire, 450 Regimental Rd., King of Prussia, Pa. 19406
Filed Feb. 19, 1980, Ser. No. 122,126
Int. Cl.³ A63B *65/02*
U.S. Cl. 272—106 **11 Claims**



8. A javelin comprising:
a. a body having separate front and rear sections, each of which includes a tapered portion extending from a small diameter tip to a large diameter end; and
b. adjustable means for matably engaging said large diameter ends to form said body, said adjustable coupling means comprising:
i. threaded insert means associated with each of said large diameter ends;
ii. coupling means for threadably engaging each of said threaded insert means; and
iii. ring means threadably engaging and movable along said coupling means to vary engagement between said coupling means and said threaded insert means;
so that movement of said ring means alters the relative distribution of weight between said front and rear sections of said body.

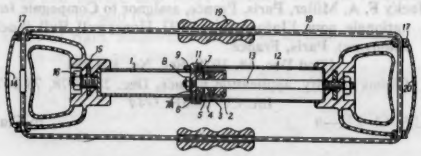
4,333,644
HACK-SQUAT MACHINE
Lloyd J. Lambert, Jr., and Lloyd J. Lambert, Sr., both of 1538 College Ave., South Houston, Tex. 77587
Filed Jan. 21, 1980, Ser. No. 113,687
Int. Cl.³ A63B *21/06*
U.S. Cl. 272—118 **10 Claims**

1. A squat and hack machine comprising in combination:
a base frame having a weight supporting cage extending upwardly therefrom and including weights therein,
a back support frame extending from a top of said weight cage to said base frame,
a pair of spaced parallel first rod members inboard of said back support frame and supported thereby,
sled means for supporting a user, said sled means being slideably disposed on said first rod members, said shed means including a back support and second rod members, said back support being attached to said second rod members,
said second rod members slideably disposed within said sled means,
means on said second rod members to selectively lock said second rod members to said sled means whereby when



unlocked, said second rod members and therefore said back support can be adjusted independently of said weights along said back support frame, and when locked said weights are operatively connected to said back support during an exercise.

4,333,645
EXERCISING APPARATUS WITH GAS RESISTANCE
Hann C. Wu, Tainan, Taiwan, assignor to Horng Meei Spring Enterprise Co. Ltd., Tainan, Taiwan
Filed Oct. 3, 1980, Ser. No. 193,797
Claims priority, application Taiwan, Dec. 14, 1979, 6824956; United Kingdom, Jun. 2, 1980, 8017920
Int. Cl.³ A63B *21/00*
U.S. Cl. 272—130 **3 Claims**



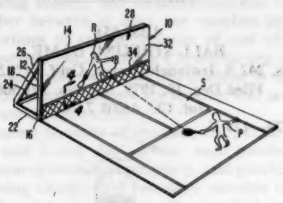
1. An exercising device comprising a cylinder having a handle fixed to one end, a piston movable in the cylinder and carried at one end of a piston rod extending through a gas-tight seal in the end wall of the cylinder opposite the handle, a further handle fixed to the other end of the piston rod, the cylinder containing a pressurized gas and the piston having a bore through which the gas can pass during compression and expansion of the device, the cylinder being permanently closed in the rotion of the cylinder opposite the gas-tight seal through which the piston rod extends so that the volume of the pressurized gas in the cylinder is decreased as the piston rod is moved further into the cylinder when an external force is applied to the handles to compress the device, the effective area of the face of the piston facing the opposite portion being larger than the effective area of the opposite face of the piston, thus the pressurized gas exerts a net force on the piston and tends to return the piston toward the rest or start position.

4,333,646

TENNIS PRACTICE AND TRAINING AID

Robert Pfeilsticker, 1815 Fite Ter., Langhorne, Pa. 19047

Filed Aug. 1, 1979, Ser. No. 62,862
Int. Cl.³ A63B 69/38
U.S. Cl. 273—29 A 4 Claims



1. In a practice and training aid for tennis players, a backboard adapted for installation upon a playing surface comprising:

(a) a backing panel adapted to be mounted in a generally vertical position and having a front surface facing forwardly toward a player stationed upon the playing surface;

(b) a transparent facing member fixedly secured to and overlying the entire front surface of the backing panel and having a wholly flat front face presenting a rebound surface for a tennis ball, said front face, over its entire area, lying in a plane tilted slightly out of the vertical in a direction such that a tennis ball propelled by a player against the rebound surface in a horizontal path will rebound upwardly therefrom toward the player at a slight angle from the horizontal; and

(c) a wholly flat mirror surface adapted to reflect the player's own image, interposed between the backing panel and the facing member and lying in a vertical plane whereby the player's image when viewed along a horizontal path at eye level is reflected along the same horizontal path as that along which it is seen by the player, said backing panel, facing member, and mirror surface being coextensive in height and width, the horizontal distance between said planes becoming progressively greater in a direction from the top to the bottom edges of said reflecting surface and said facing member, whereby a tennis ball propelled along a horizontal path by a player against the tilted front face of the facing member will rebound upwardly therefrom toward the player in a path inclined at a slight angle from the horizontal, while at the same time the player's reflected image as viewed along a parallel horizontal path in the vertical mirror surface through the transparent facing member will be reflected along the same horizontal path as that along which it is seen by the player.

4,333,647

ARM CONTROL DEVICE FOR ATHLETE

William J. Schaefer, 3706 Jay La. South, Rolling Meadows, Ill. 60008

Filed Apr. 22, 1980, Ser. No. 142,672
Int. Cl.³ A63B 69/00
U.S. Cl. 273—54 B 7 Claims

1. An athletic hand movement restricting device comprising:

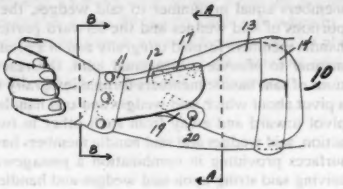
hinged plate assembly means for connecting a user's forearm and wrist;

said hinged plate assembly means including forearm means to be secured to a user's forearm just below the elbow and wrist means to be secured to a user's wrist;

means for securing said forearm means to a user's forearm just below the elbow;

means for securing said wrist means to a user's wrist;

said hinged plate assembly means being so constructed as to allow unrestricted relation of the user's wrist, hand and thumb about an axis passing through the forearm and wrist in a direction away from the body while restricting



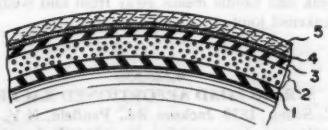
rotation beyond a predetermined point in the opposite direction.

4,333,648

INFLATABLE GAME BALL

Masayoshi Aoyama, Hiroshima, Japan, assignor to Molten Rubber Industry Co., Ltd., Hiroshima, Japan

Filed Jan. 25, 1980, Ser. No. 115,224
Claims priority, application Japan, Feb. 6, 1979, 54/11870; Jul. 19, 1979, 54/90979
Int. Cl.³ A63B 41/10, 45/00; B65H 81/00
U.S. Cl. 273—65 EB 4 Claims



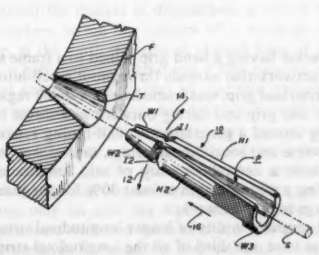
1. A ball of the inflatable type consisting essentially of a hollow rubber tube used as a ball substrate which is inflated with a gas under pressure, a reinforcing thread winding layer formed by winding a reinforcing nylon filament thread and a rubber thread simultaneously with each other along the outer periphery of said rubber tube, and a surface cover layer covering said reinforcing thread winding layer therewith through an adhesive, said surface cover layer being made of a natural or synthetic leather stock.

4,333,649

RACKET STRING CLAMP

George A. Vaughn, Princeton, and Francis J. Fuchs, Jr., Princeton Junction, both of N.J., assignors to AMF Incorporated, White Plains, N.Y.

Continuation-in-part of Ser. No. 128,158, Mar. 7, 1980, abandoned. This application Oct. 1, 1980, Ser. No. 192,689
Int. Cl.³ A63B 51/00
U.S. Cl. 273—73 D 8 Claims



1. A racket string clamp for securing an end portion of a

game ball string in a hole extending through the frame of a game ball racket, comprising:

integrally formed plurality of opposed wedges and handle means, said handle means defined by a plurality of handle members equal in number to said wedges, the rearward portions of said wedges and the forward portions of said handle members formed integrally and in a predetermined manner to provide a weakened joint, the rearward portions of said handle members formed integrally to provide a pivot about which said wedges and said handle members pivot toward and away from each other in tweezer-like action, said wedges and said handle members having inner surfaces providing in combination a passageway for receiving said string upon said wedges and handle members pivoting away from each other;

upon said string being received within said passageway said wedges and handle members pivoting towards each other and said passageway aligning the inner surfaces of said wedges and said handle members with respect to said string prior to the insertion of said wedges into said hole, and said handle means for being gripped by an operator to slide said aligned wedges and handle members along said string and to insert said wedges into said hole and to wedge said wedges between said string end portion and the racket frame surface defining said hole to secure said end portion of said string to said racket frame; and

upon said end portion of said string being secured to said racket frame, said handle means for being moved back and forth with respect to said wedges by said operator to break said handle means away from said wedges at said weakened joint.

4,333,650

STRING LOAD APPORTIONED RACKET

Tsai C. Soong, 1839 Jackson Rd., Penfield, N.Y. 14526

Continuation-in-part of Ser. No. 136,907, Apr. 3, 1980, abandoned, which is a continuation-in-part of Ser. No. 120,160, Feb. 11, 1980, abandoned, which is a continuation-in-part of Ser. No. 68,572, Aug. 22, 1979, abandoned. This application Jan. 26, 1981, Ser. No. 228,577

Int. Cl.[3] A63B *51/00*

U.S. Cl. 273—73 D **21 Claims**

1. A racket having a hand grip joined to a frame supporting a string network that extends throughout a ball-hitting region spaced from said grip, said frame having a shank region extending from said grip and flaring outward in a throat region and extending around a generally oval ball-hitting region spanned by transverse and longitudinal strings, said racket comprising:

a. at least a central plurality of said longitudinal strings having a strung length at least 30% longer than all other strings in said network;

b. said central plurality of longer longitudinal strings including at least one-third of all the longitudinal strings in said network; and

c. said longer longitudinal strings being strung with at least 30% more tension than all other strings in said network so that said longer strung length and greater tension causes said longer longitudinal strings to provide from approximately half to substantially more than half of the string force that decelerates a ball penetrating said string network in a central region occupied by said longer longitudinal strings.

4,333,651

BALL STRIKING GAME

Luis Ingels, 242 S. Irwindale, Azusa, Calif. 91702

Filed Dec. 10, 1979, Ser. No. 101,500

Int. Cl.[3] A63B *71/00*

U.S. Cl. 273—129 V **12 Claims**

1. In a game in which a club has a handle and a head for striking a ball toward a target the improvement comprising:

a pivoted striker plate comprising a face on said head which can pivot between an open and closed position;

a spring biasing said striker plate toward an open position;

latch means in the form of a hook on the end of a pivoted lever arm engaging a slot in said striker plate latching said plate in a closed position against the force of said spring; and

release means releasing said latch means whereby said plate can swing open and strike a ball placed adjacent to said striker plate toward a target.

4,333,652

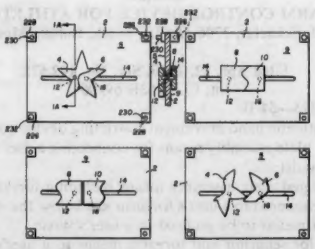
TWO-SIDED PUZZLE

Robert E. Clancy, 13 Mays Ave., Hornell, N.Y. 14843

Filed Oct. 14, 1980, Ser. No. 196,739

Int. Cl.[3] A63F *9/08*

U.S. Cl. 273—153 S **10 Claims**



1. A two-sided puzzle comprising:

a substantially flat support member having upper and lower side surfaces;

at least one elongated slot of a finite width extending through said support member from said lower side surface to said upper side surface;

at least a first plurality of separate, flat puzzle members adjacent said upper side surface, each puzzle member having a non-symmetrical periphery, said puzzle members further being slidably and rotatably movable relative to one another between at least one matched position, in which portions of said peripheries of said plurality of puzzle members match to form a figure having a symmetrical periphery, and an unmatched position, in which said plurality of puzzle members are separate and said peripheries thereof do not match;

at least a second plurality of separate, flat puzzle members adjacent said lower side surface, each puzzle member having a non-symmetrical periphery, said puzzle members further being slidably and rotatably movable relative to one another between at least one matched position, in which portions of said peripheries of said plurality of puzzle members match to form a figure having a symmetrical periphery, and an unmatched position, in which said plurality of puzzle members are separate and said peripheries thereof do not match; and

means extending through and slidable within said slot for rigidly coupling at least one of said puzzle members of said first plurality of puzzle members to a corresponding puzzle member of said second plurality of puzzle members for slidable and rotatable movement of said coupled puzzle members within said slot whereby slidable and rotatable movement of one of said first and second pluralities of puzzle members to its matched position automatically moves the other of said first and second pluralities of puzzle members to an unmatched position.

4,333,653

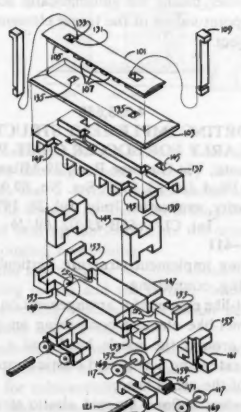
SAN FRANCISCO CABLE CAR PUZZLE

Michael D. Maynard, 4770 W. Mars, Tucson, Ariz. 85704

Filed Aug. 21, 1980, Ser. No. 179,975

Int. Cl.³ A63F *9/12*

U.S. Cl. 273—160 **10 Claims**



1. A puzzle assemblage take-apart toy resembling the San Francisco cable car comprising a plurality of interlocking parts each forming part of the structure, each of said parts having a fitting connection in respect to each of said other parts and each of said parts being mounted in sequence upon preceding assembled parts, said parts being assembled in a predetermined sequence to form the San Francisco cable car, all said parts held in fixed configuration by two key pieces, said parts defining an upper roof piece, a subroof connected to and spaced below the upper roof piece, window pieces connected to and spaced below said subroof, base pieces connected to and spaced below said window pieces, axle housings connected to and spaced below said base pieces, and wheels connected to said axle housings whereby when all said pieces are assembled, said toy resembles a San Francisco cable car whereby said puzzle assemblage take-apart toy may be assembled by placing in order each part and, when assembled, inserting said key pieces to hold said toy in final fixed configuration.

4,333,654

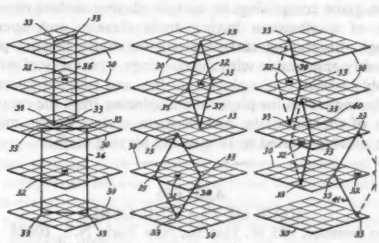
GAME

John C. Allain, deceased, late of New Iberia, La. (Regina Gonsoulin Allain, administratrix), assignor to Regina Gonsoulin Allain; John Russell Allain; Timothy Stephen Allain and Christina Rita Allain, all of New Iberia, La., part interest to each

Filed Jul. 5, 1979, Ser. No. 54,682

Int. Cl.³ A63F *3/00*

U.S. Cl. 273—241 **1 Claim**

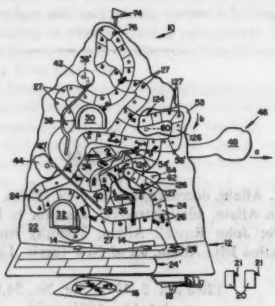


1. Method for play of a game on surface means comprising plural coplanar areas disposed side by side in equal parallel rows of at least three areas each in mutually transverse directions on each of a plurality of vertically spaced identical levels of such areas, comprising placing by each player of a distinguishable set of plural markers each on any unoccupied area of any level of such areas, some of said areas remaining unoccupied, each player playing in repetitive sequential turn by moving a single marker of his said set of markers from its prior disposition on an area of a level to any unoccupied other area on the same level or on any other of said levels, capturing and removing a marker of one player when markers of another player become disposed on one or more of said levels to adjacently surround the marker in dispositions in which the surrounding markers define the corners of a rectangle or of a diamond or, at the vertically spaced aligned sides of three of said levels, a half diamond, removing a first player's markers from a level and terminating play by said first player on the said level when said first player has no more than three markers remaining on said level, removing one player's markers from any level when only said one player has more than three markers thereon and placing said one player's markers on an unoccupied area of any one or more of the other said levels, discontinuing play on said any level after said one player's markers have been removed from said any level, continuing play be each player in repetitive turn until only one player having more than three markers remaining on a single level on which play has not been discontinued remains as winner of the game.

4,333,655
MOUNTAIN CLIMBER GAME WITH MOVEABLY ATTACHED PIECES

Elliot A. Rudell, 2422 Curtis Ave., Redondo Beach, Calif. 90278; Joseph S. Cernansky, Manhattan Beach, and Richard P. Kamrath, Redondo Beach, both of Calif., assignors to Elliot A. Rudell, Lawndale, Calif.

Filed Jul. 24, 1980, Ser. No. 171,904
Int. Cl.[3] A63F *3/00*
U.S. Cl. 273—241 3 Claims

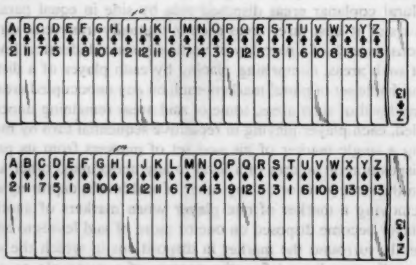


1. A game comprising: an upright playing surface representative of a mountain having trails thereon and openings through the playing surface along the trails, playing pieces releasably engageable with the openings, a plurality of missiles movably related to the playing surface and adapted to contact the playing pieces for physically displacing from the representation of the mountain, and wherein certain of the missiles being slidably related to slots in the playing surface.

4,333,656
DECK OF PLAYING CARDS

Steven Sommer, 305 W. 91st St., New York, N.Y. 10024

Filed Feb. 27, 1981, Ser. No. 238,886
Int. Cl.[3] A63F *1/00*
U.S. Cl. 273—299 2 Claims



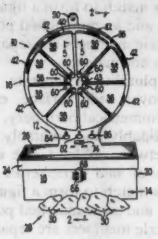
1. A deck of playing cards comprising 104 individual cards, the cards of the deck being divided into four suits of 26 cards each, each card of each suit bearing, in addition to its respective suit marking, a different one of the 26 letters of the English alphabet, and

each card of each suit also bearing a number representative of the frequency with which the letter borne by the card occurs in words in the English language, the more frequently used letters corresponding to lower numbers and the less frequently used letters corresponding to higher numbers, said numbers being one to thirteen, inclusive, in a consecutive series appearing on at least thirteen cards of each suit, said numbers constituting the sole means for ranking the cards in each suit.

4,333,657
ELECTRONIC DART GAME

Eugene Jaworski, Park Ridge; Harry Disko, South Barrington, and Jeffrey D. Breslow, Highland Park, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 8, 1980, Ser. No. 119,888
Int. Cl.[3] A63F *9/02*; F41J *5/04*
U.S. Cl. 273—376 25 Claims



1. A microcomputer controlled target game, comprising;

a housing;

a plurality of player actuable target elements mounted on said housing, said target elements being arranged in a generally radial array;

at least one game object;

microcomputer control means for detecting the actuation of a target element by a game object;

means for producing a sensorially perceptible event in response to the detection by said control means of the actuation of a target element;

microcomputer means for detecting the simultaneous actuation of more than one element;

means for automatically accruing a game point value for the simultaneous actuation of more than one target element; and

microcomputer means for automatically accumulating the accrued point values of the target elements actuated by a game object.

4,333,658
SPORTING IMPLEMENT STRUCTURE, PARTICULARLY FOR SOCCER GAME PRACTICING

Giuliano Giovetti, Via Giacomo Boni, 29-Milano, Italy

Filed Jul. 23, 1979, Ser. No. 59,939
Claims priority, application Italy, Jul. 28, 1978, 22483/78[U]
Int. Cl.[3] A63B *43/02, 69/26*
U.S. Cl. 273—411 2 Claims

1. A sporting implement structure particularly for soccer game practicing, comprising:

(a) a helmet-like element for arrangement on the user's head, said helmet-like element comprising an elastic strap for location around the user's head and a top supporting member extending across said elastic strap for location on the top of the user's head;

(b) two eyelets defined by said elastic strap adjacent the user's temples, said eyelets being formed by joining together two spaced apart areas of said elastic strap;

(c) a pair of strings each having one end carrying a ball and another end engaging said elastic strap at a corresponding one of said eyelets;

wherein said top supporting member comprises a string-like member and said elastic strap further comprises two spaced apart through holes in a front portion thereof between said eyelets, said string-like member having a portion inserted through said holes and a front end of said portion re-united to a middle portion of said string-like

member to form a substantially triangular arrangement adjacent said front portion of said elastic strap, said string-

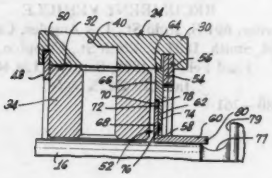
like member further having a rear end adjustably secured to a rear portion of said elastic strap.

4,333,659

TURBOCHARGER SHAFT SEAL ARRANGEMENT

Craig A. Gibbs, Stanton, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jul. 28, 1980, Ser. No. 172,870
Int. Cl.³ F16J *15/40*
U.S. Cl. 277—1 20 Claims



1. In a turbocharger having a center housing with a bearing bore receiving bearing means rotatably supporting a turbocharger shaft, and a turbine wheel mounted on said shaft within a turbine housing, a shaft seal arrangement for preventing leakage of bearing lubricant from the center housing into the turbine housing, comprising:

a first annular seal member received about the shaft between the bearing means and the turbine housing for substantially preventing leakage of lubricant between said first seal member and the shaft;

a second annular seal member received within the center housing generally in axial alignment with said first seal member for substantially preventing leakage of lubricant between said second seal member and the center housing; and

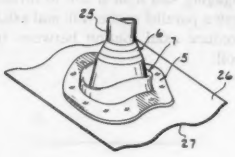
said first and second seal members respectively including axially presented sealing faces in sealing bearing engagement with each other for substantially preventing leakage of lubricant between said seal members, said sealing faces being radially movable with respect to each other to accommodate radial excursions of the shaft and wherein said shaft includes slinger means defining an annular recess adjacent said seal members and a radially projecting flange adjacent the end of said recess opposite said seal members, said first seal member including an axially projecting leg extending along the shaft and terminating with a slight overhang annularly about said recess.

4,333,660

SEAL DEVICE FOR PIPE PROJECTING THROUGH ROOF

George M. Cupit, 5 Waldheim Rd., Bayswater, Victoria, Australia

Continuation of Ser. No. 870,102, Jan. 17, 1978, abandoned. This application Mar. 3, 1980, Ser. No. 126,200
Claims priority, application Australia, Jan. 17, 1977, PC 8770
Int. Cl.³ F16L *41/06;* F16J *15/00*
U.S. Cl. 277—9 6 Claims



1. A seal device to provide a fluid seal between an elongate member and a non-planar surface through which the elongate member projects, comprising a base member capable of conforming attachment to the non-planar surface, said base member comprising an apertured metal outer flange element of non-resilient manually deformable nature so that in use it may be deformed to conform with the contour of the non-planar surface to which it is to be attached and will by itself generally retain such deformed contour and a complementary apertured sealing element of non-metallic resilient material with a flange portion secured in underlying relation to said metal outer flange element with respective apertures aligned and so as to be compressed between the metal outer flange element and the non-planar surface to which the device is to be attached in use to provide a seal therebetween, a sleeve member of non-metallic resilient material integral with the sealing element and projecting through the aperture in the metal outer flange element, said sleeve member when in use having at an end portion remote from the base member an aperture dimensioned to receive the elongate member in sealing engagement, the sleeve member between the said end portion and the base member being flexible to accommodate in use misalignment between the base member and the apertured portion of the sleeve, said metal outer flange element, when deformed to the contour of the non-planar surface to which it is attached, maintaining the flange portion of said sealing element in a similarly deformed contour to abut said non-planar surface in sealing engagement therewith.

4,333,661

EXPANDING HELICAL SEAL FOR PISTONS AND THE LIKE

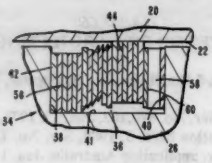
David A. Merrell, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 5, 1980, Ser. No. 213,429
Int. Cl.³ F16J *15/16, 9/04*
U.S. Cl. 277—203 5 Claims

1. A seal comprising:

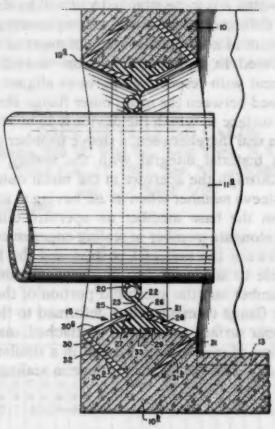
a continuous helical spiral coil made of resilient material and having a small end, a large end of larger diameter than said small end and an intermediate transitional portion therebetween, said helical spiral coil being for positioning in a seal groove so that one of said ends seals in the groove as a stationary seal and the other of said ends extends out of the groove for engaging on a relatively moving wall as a dynamic seal, with the resiliency of said helical spiral coil stressing said helical spiral coil to engage both as a static

seal in the groove and as a dynamic seal against the wall; and



a spring engaging said helical coil to thrust said helical coil in a direction parallel to the wall and axially of said helical coil to reduce axial motion between the turns of said helical coil.

4,333,662
PIPE SEAL
William D. Jones, 803 Monaco Dr., Warrington, Pa. 18976
Filed Dec. 9, 1980, Ser. No. 214,692
Int. Cl.³ F16L *21/02*; F16J *15/32*
U.S. Cl. 277—207 A **14 Claims**



1. A resilient gasket for sealing an annular space between a pipe and a surrounding aperture in a pipe receiving structure, comprising:

an annular ring adapted to engage the outer periphery of the pipe,

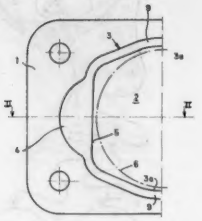
a flexible neck integral with said ring and extending outwardly therefrom,

a base surrounding said neck integral therewith,

said base having a portion embedded within said pipe receiving structure and having a portion exposed to said pipe, said exposed portion extending laterally of said neck in opposite directions beyond the ring,

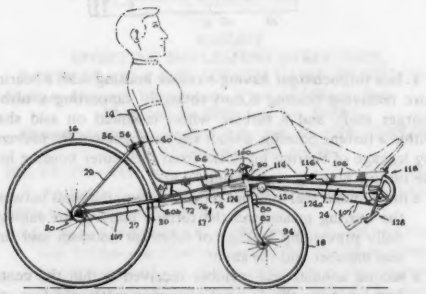
said flexible neck cooperating with said base to afford both lateral and radial motion of the ring relative to the base and compression of the ring against the exposed portion of the base.

4,333,663
FLAT GASKET
Karl-Gerd Friedrichs, Leverkusen, Fed. Rep. of Germany, assignor to Goetze AG, Burscheid, Fed. Rep. of Germany
Filed Dec. 13, 1979, Ser. No. 103,217
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1978, 2856186
Int. Cl.³ F16J *15/12*
U.S. Cl. 277—235 R **5 Claims**



1. In a flat gasket having a closed edge defining an opening, a metal frame surrounding the opening and having curvilinear length portions bent over the closed edge along the length thereof; said frame having rims on both sides of the gasket and a part connecting the rims and extending over said edge; and metal overlays arranged adjacent the frame in a face-to-face relationship with the gasket on both sides thereof; the improvement wherein each overlay comprises a flap-like, one-piece, integral extension of the rims on both sides of said gasket along a length portion of said frame and further wherein said length portion has a linear course.

4,333,664
RECUMBENT VEHICLE
Milton Turner, 691 S. Irolo St., Los Angeles, Calif. 90005, and Julian M. Smith, 1607 E. 126th St., Compton, Calif. 90222
Filed Feb. 25, 1980, Ser. No. 124,441
Int. Cl.³ B62K *3/14*
U.S. Cl. 280—261 **22 Claims**



1. In a bicycle adapted to be propelled by a recumbent rider, including an elongated frame having a front portion and a rear portion, a front wheel rotatably mounted on the frame, a rear wheel rotatably mounted the rear portion of the frame, a crank assembly including crank pedals supported on the front portion of said frame, a front fork support housing secured to the frame intermdiate said front and rear portions and rotatably supporting said front wheel, and a seat supported on said frame generally intermediate said wheels, the improvement comprising:

a support member connecting the back of said seat with the rear portion of said frame for reinforcing the rear portion of said frame and for resisting torsional rotational move-

ment of said seat relative to said frame through pressures against said seat back as said bicycle is driven by force being applied alternately to said pedal cranks,

said rear portion of said frame comprising a fork including substantially horizontal left and right tongs, said left and right tongs supporting said rear wheel; said fork further including left and right stays connected to the rear of said left and right tongs respectively, and extending upwardly and forwardly toward the back of said seat;

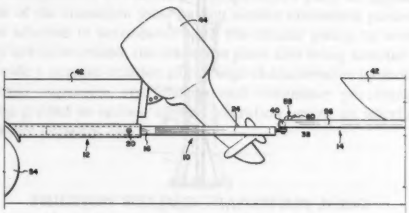
and said support member comprises an X member diagonally connecting said left stay with said right tong of said rear fork and diagonally connecting said right stay with said left tong of said rear fork, and means connecting said X member to the back of said seat.

4,333,665

DETACHABLE TRAILER HITCH

Paul D. Haddock, 1605 W. Knoxville, Broken Arrow, Okla. 74012

Filed Sep. 5, 1980, Ser. No. 184,273
Int. Cl.³ B60D 1/14
U.S. Cl. 280—408 **8 Claims**



1. In combination with at least two trailers, a detachable trailer hitch apparatus for connecting trailers in spaced tandem relation, said hitch apparatus comprising frame means having a connection section for engagement with the trailing end of one of said trailers, means cooperating between the connection section and the said trailing end for removably connecting the hitch apparatus to said one trailer, inwardly diverging frame means extending outwardly from said connection section in a direction away from said one trailer, and hitch means disposed outboard of said diverging frame means for removable connection with the leading end of the other of said trailers for connecting the trailers in said spaced tandem relation.

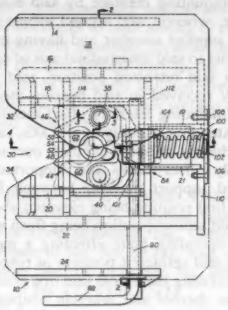
4,333,666

HITCH HEAD HAVING INTERLOCKING JAW MECHANISM

James C. Hammonds, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Jun. 12, 1980, Ser. No. 158,962
Int. Cl.³ B62D 53/08, 53/10, 53/12
U.S. Cl. 280—435 **17 Claims**

1. A hitch head or fifth wheel comprising: a pair of pivotable jaws adapted to hold in place a kingpin of a highway trailer; a horizontally movable lock block, said lock block biased by resilient means to a closed position engaging the jaws and holding said jaws in closed position; said jaws adapted to maintain the kingpin in place; said lock block being movable to an open position by a finger engaging the lock block; said finger integrally connected to a horizontally extending operating shaft; said finger comprising a body portion surrounding said shaft; a first finger extension extending in a first radial direction from said body portion, and a second finger extension extending in a second radial direction from said body portion; whereby said jaws are movable to an open position upon exit of the kingpin; the rear portion of each of said jaws having a rear surface, whereby if one of said jaws begins to move from open position toward closed position and the other jaw does not, the rear surface on said one jaw will activate said first finger extension and pivot said finger sufficiently that said second finger extension will engage the rear surface on the other jaw,



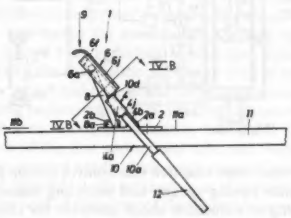
thereby preventing further rearward movement of said lock block and said lock block preventing said first jaw from moving further toward the closed position.

4,333,667

SKI BRAKE

Friedrich Leichtfried, Traiskirchen, and Alois Himmetsberger, Vienna, both of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Dec. 19, 1979, Ser. No. 105,069
Claims priority, application Austria, Dec. 21, 1978, 9119/78; Feb. 5, 1979, 846/79
Int. Cl.³ A63C 7/10
U.S. Cl. 280—605 **14 Claims**



1. In a ski brake having at least one braking leg pivotal by a force applied by a ski boot or by a sole plate secured to a ski boot to a pedal about an axle extending substantially at a right angle with respect to the longitudinal axis of a ski in a mounting member adapted to be secured to said ski, said braking leg being pivotal between a braking position and a retracted position, an erecting spring resisting a pivoting of said braking leg toward said retracted position, said braking leg having a braking mandrel thereon and a first segment therein which extends from said braking mandrel toward the central longitudinal axis of the ski, said braking leg being held totally above the upper surface of said ski and between the lateral edges of said ski in the retracted position of said ski brake by said pedal which is stepped down upon by said ski boot or by said sole plate, and in the braking position of said ski brake, said braking mandrel being positioned laterally outside of one of said ski edges and projecting below the running surface of said ski, said braking leg being pivotal about first means defining a swivel shaft which extends in longitudinal direction of said ski, said first means including at least one further second segment on said braking leg which extends substantially parallel with respect to said central longitudinal axis of said ski brake, and second

means operatively connecting said second segment to said axle to facilitate said pivotal movement of said braking leg about the axis of said second segment, the improvement comprising wherein said pedal includes a support member pivotally secured to said mounting member by said axle for movement about said axle, wherein said second means includes bearing means on said support member and having an axis extending generally parallel to said longitudinal axis of said ski when said ski brake is in said retracted position, said second segment being rotatably received in said bearing means, said second means further including laterally offset means on said second segment and extending laterally of said axis, said second means still further including an operating plate operatively connected to said laterally offset means and supported for movement relative to said support member between first and second positions, said first position being elevated above said support member and said second position being flush with said support member, said operating plate effecting a movement of said braking leg to said retracted position in response to a movement of said operating plate from said first position toward said second position thereof and wherein resilient means is provided for continually urging said operating plate to said first position.

4,333,668

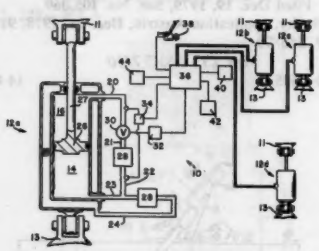
ELECTRONIC ADAPTIVE RIDE CONTROL SYSTEM

Richard T. Hendrickson, and Joel S. Carter, both of South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Dec. 17, 1979, Ser. No. 104,326

Int. Cl.³ B60G *21/00*

U.S. Cl. 280—703 **1 Claim**



1. An electronic adaptive ride control system for an automotive vehicle having sprung and unsprung masses, said system comprising an adjustable shock absorber for resisting the relative motion of said sprung and unsprung masses of said vehicle, said shock absorber comprising a pair of variable-volume chambers between which fluid is communicated in response to relative motion of said sprung and unsprung masses, variable fluid flow resistance means for adjusting the motion resistance of said shock absorber by interrupting said fluid communication independent of the relative position of said masses, in response to control signals generated by a control unit of said system;

said variable fluid flow resistance means comprising valve means for opening and closing said fluid communication between said pair of chambers, and servo means operatively coupled to said valve means for controlling the opening and closing of the valve means in response to said control signals;

said shock absorber also comprising pumping means defining said pair of variable-volume chambers for pumping viscous fluid through the valve means in response to relative motion of the masses;

a housing connected to one of the masses;

a rod connected to the other of the masses;

a piston connected to the rod and cooperating with the housing to define said pair of chambers for containing viscous fluid therewithin, the piston being movable relative to the housing to transfer fluid between said chambers and through said valve means in response to relative movement of the masses;

said housing, said rod, and said piston cooperating to define said pumping means; and

said shock absorber further comprising a passage disposed outwardly of the housing and communicating said pair of chambers with each other, said passage receiving said valve means whereby fluid communication through said passage is varied in response to said control signals.

4,333,669

BRAZED OR SOLDERED JOINTS

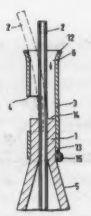
Roland Eckert, Sulzfeld, Fed. Rep. of Germany, assignor to E.G.O. Elektro-Geräte Blanc und Fischer, Fed. Rep. of Germany

Filed Apr. 23, 1980, Ser. No. 142,919

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1979, 2917335

Int. Cl.³ F16L *13/08*

U.S. Cl. 285—21 **10 Claims**



1. A brazed or soldered joint between a connecting socket having a free end and a thin, flexible metal tube inserted therein, comprising a thin-walled metal sleeve surrounding the connecting socket, a portion thereof embracing the connecting socket and another portion thereof extending beyond the free end of the connecting socket, surrounding the metal tube but having a sufficiently large free clearance to preclude capillary action between the metal sleeve and the metal tube during the brazing or soldering, the metal sleeve being provided with at least one aperture in the area of the free end of the connecting socket into which brazing or soldering material can be deposited in the form of a paste which after heating will braze or solder together the metal tube and the sleeve to the connecting socket by capillary action, but will not hinder movement of the flexible metal tube within the metal sleeve, whereby the metal sleeve enhances the integrity of the brazed or soldered joint, and thereafter, prevents kinking and accidental breaking of the metal tube.

4,333,670

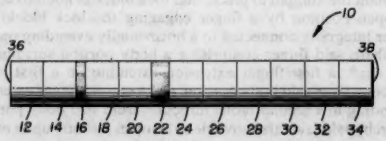
STEPPED TRANSITION JOINT

Kenneth H. Holko, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed May 5, 1980, Ser. No. 146,491

Int. Cl.³ F16L *13/02*

U.S. Cl. 285—173 **12 Claims**



1. A transition joint which must withstand severe conditions

in high temperature environments and useful for bonding together tubular pieces formed respectively from a low alloy or carbon steel and a high temperature alloy having a high chromium content of approximately 18%, the low alloy steel and high temperature alloy tubular pieces also having substantially different characteristics such as thermal expansion coefficients, strength and the like, said transition joint comprising a plurality of tubular transition parts aligned along a common longitudinal axis and welded together, a first adjacent pair of transition parts each having chromium contents less than 10 percent being characterized by a maximum chromium differential between the parts of approximately 2–5%, a further adjacent transition part having a chromium content greater than 10 percent and a maximum chromium differential in the range of approximately 3–7% between adjacent transition parts, said tubular transition parts of the lowest chromium content having end faces perpendicular to said longitudinal axis and extending across the full wall thickness thereof, some of the transition parts being selected from standard ASTM code approved materials, each of said transition parts having throughout its length substantially the same thermal expansion coefficients and composition of elements, the transition parts at opposite ends of the transition joint having similar chromium percentages selected in accordance with the tubular pieces to which they are to be joined, the transition parts also being selected to provide a stepped relation of physical characteristics including thermal expansion coefficients, said chromium percentages being graded to reduce carbon migration across an interface between adjacent end faces.

4,333,671

FRICTION WELDED TRANSITION JOINT

Kenneth H. Holko, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed May 5, 1980, Ser. No. 146,771

Int. Cl.³ F16L *13/02*

U.S. Cl. 285—173 **3 Claims**

1. A bonded transition joint for use in high temperature applications which must withstand severe conditions in high temperature environments comprising at least three tubular transition parts:

a first tubular part of low alloy or carbon steel having a first predetermined chromium content with a uniform thermal expansion coefficient, strength and carbon constituency throughout and having a longitudinal extending axis,

a second tubular part of a higher chromium alloy with a uniform thermal expansion characteristics, strength and carbon constituency throughout and having a longitudinally extending axis aligned with the longitudinally extending axis of said first tubular part;

a third tubular part of a high temperature alloy and having a higher chromium content than said predetermined chromium content,

a first interface on the end of said first tubular part in a plane perpendicular to the axis of said first tubular part and having a cross-sectional thickness equal to the thickness of said first tubular part,

a second interface on the end of said second tubular part in a plane perpendicular to the axis of said second tubular part and having a cross-sectional thickness equal to the thickness of said second tubular part,

at least a portion of the transition parts within the transition joint being formed from standard, code approved materials to assure effective operation over long periods of time,

said first and second interfaces being abutted and bonded to each other by friction welding without any weld material between said interfaces to limit mixing of compositions of said first and second materials, to limit the migration of carbon from the first tubular part to the second tubular part, and to reduce thermally induced stresses,

said third tubular part being friction welded to another end of said second tubular part.

4,333,672

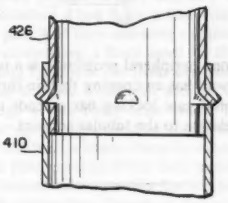
TUBE-TO-TUBE CONNECTION

James C. Arthur, and Graham F. Thieman, both of Columbus, Ind., assignors to Arvin Industries, Inc., Columbus, Ind.

Continuation-in-part of Ser. No. 65,131, Aug. 9, 1979. This application Dec. 10, 1979, Ser. No. 101,734

Int. Cl.³ F16L *13/14*

U.S. Cl. 285—382.2 **10 Claims**



1. A mechanical connection, comprising a first tube including a first tube end having a first inside dimension, a second tube including a second tube end having a second outside dimension, the second dimension being slightly smaller than the first to provide a sliding fit of the second tube end into the first tube end, and means for mechanically joining said first tube and said second tube including at least two staked segments in generally the same plane about the axes of said first and second tubes, each staked segment comprising a circumferentially extending registering strip of the first and second tube side walls, with at most one of the axially facing side edges of the strip of each of the first and second tube side walls being sheared and the sheared axially facing side edge of one of the first and second tube side walls protruding at least substantially to a region of the wall of the other of the first and second tubes surrounding the strip, whereby rotational and longitudinal movement of the tubes with respect to each other is prevented.

4,333,673

GATE LATCH

Kenneth G. Kerr, Timboon, Australia, assignor to Ada Margery Kerr; Alan Gordon Kerr; Keith Edward Kerr; Bruce Kenneth Kerr and Colin Frederick Kerr, all of Timboon, Australia

Continuation-in-part of Ser. No. 936,727, Aug. 25, 1978, Pat. No. 4,226,450. This application Apr. 4, 1980, Ser. No. 137,017

Claims priority, application Australia, Aug. 25, 1977, PD1379; Oct. 21, 1977, PD2149; Feb. 12, 1980, PE2331

Int. Cl.³ E05C *5/02*

U.S. Cl. 292—59 **10 Claims**

1. A gate latch comprising:

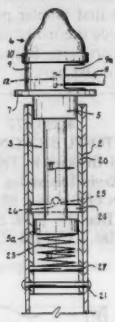
a tubular support;

a latch member having a shaft portion, mounted within said tubular support for rotation therein, and also having a latch portion, extending axially outwardly from said shaft portion, said latch portion having at least one peripheral projection extending axially outwardly from said shaft portion; and

a complemental gate locking bar extending from a gate and having locking means, at its free end, for engaging the latch portion within spacing defined by said at least one

peripheral projection in order to lock the gate relative to said tubular support;

wherein said at least one peripheral projection defines the spacing so as to permit entry of the complemental gate locking bar;



said at least one peripheral projection is a tubular wall; and said tubular wall has an opening therein through which the complemental gate locking bar extends in order to lock the gate relative to the tubular support.

4,333,674

VEHICLE BUMPERS WITH COLLAPSIBLE PARTS

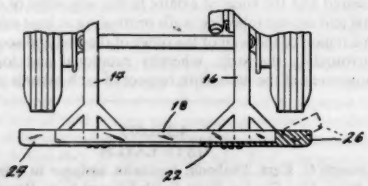
Carl F. Buettner, 9501 Pinespray, St. Louis, Mo. 63126, and John S. Hill, 604 Plaza Dr., Joplin, Mo. 64801

Continuation-in-part of Ser. No. 883,829, Mar. 6, 1978, Pat. No. 4,225,167. This application Feb. 14, 1980, Ser. No. 121,325

The portion of the term of this patent subsequent to Sep. 30, 1997, has been disclaimed.

Int. Cl.[3] B60R *19/00*

U.S. Cl. 293—120 17 Claims



1. A one-piece bumper for mounting on a vehicle having a predetermined width comprising a main body section for connecting to the vehicle and end sections connected integrally to the main body section, said main body section including said integrally connected end sections having an overall length to extend substantially across the width of the vehicle, means forming an integral connection between the main section and each of the end sections including a groove defining a location of substantially reduced cross-section therebetween, said main body section and said end sections having relatively uniform thickness along the length thereof but being substantially less thick at the locations of said grooves, said main body section and said integral end sections being constructed of a frangible material whereby said end sections are more likely to break away from said main body section at the locations of the respective grooves on impact rather than to bend.

4,333,675

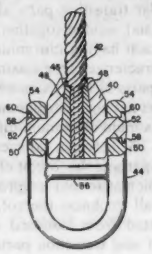
CABLE CONNECTOR

Ben Wirkkala, P.O. Box 524, Naselle, Wash. 98638

Filed Jan. 4, 1980, Ser. No. 109,469

Int. Cl.[3] B66C *1/34*

U.S. Cl. 294—78 R 1 Claim



1. A cable connector for interconnecting a mainline cable with a plurality of choker cables, comprising:

a generally u-shaped shackle having side arms in which aligned openings are formed;

a pin bridging the space between the side arms of said shackle, said pin having the ends thereof freely rotatable in said openings and restraining means formed on the ends of said pin for preventing endwise movement thereof;

a ferrule formed as an integral part of said pin and positioned midway between the side arms of said shackle, said ferrule having a tapered frustro-conically shaped centerbore through which said mainline cable extends;

a cable fastening means comprising a pair of semi-frustro-conically shaped nubbins tapered to match the taper of the centerbore of said ferrule, said nubbins each having a semi-cylindrically shaped groove extending along the axis thereof which together form a central cylindrical passage through which said mainline cable extends and is frictionally held between said nubbins, said nubbins contacting the wall of said centerbore over the major surface area of said centerbore in order to maximize the strength and rigidity of said fastening means; and

a reinforcing bar extending between said side arms to prevent either withdrawal of the ends of said pin from said openings or spreading of said arms of the shackle responsive to spreading forces applied to said shackle.

4,333,676

ROTATIONAL MECHANISM FOR AN EXCAVATOR GRAB BUCKET

Heinz Thumm, Fellbach-Oeffingen, Fed. Rep. of Germany, assignor to Firma Thumm Ölhydraulische Antriebe GmbH, Fellbach-Oeffingen, Fed. Rep. of Germany

Filed Feb. 23, 1981, Ser. No. 237,064

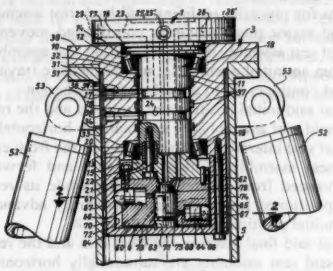
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1978, 2838346

Int. Cl.[3] B25B *1/00*

U.S. Cl. 294—88 11 Claims

1. Apparatus for actuating a grab bucket of an excavator comprising: a stator mounted on said excavator; a rotor having said grab bucket mounted thereon connected with said stator for rotation relative thereto about a rotational axis; a shaft on said stator operatively engaged within a bore formed in said rotor; first hydraulic duct means extending through said stator; second hydraulic duct means extending through said rotor; passage means defined between said stator shaft and said rotor bore for placing said first and second hydraulic duct means in operative communication with each other; said first and said second hydraulic duct means being adapted to be operatively connected with hydraulic drive means for actuation of said grab bucket; first and second shoulder means defined on said

stator shaft axially spaced from each other and protruding radially therefrom; third and fourth shoulder means defined on said rotor arranged in cooperative relationship, respectively, with said first and second shoulder means of said stator shaft; first axial-radial bearing means operatively interposed between said stator shaft and said rotor axially located between said first



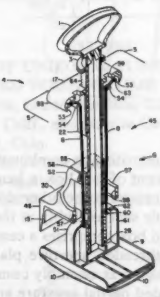
and third shoulder means; and second axial-radial bearing means operatively interposed between said stator shaft and said rotor axially located between said second and fourth shoulder means; said passage means being axially located relative to said stator shaft between said first and said second axial-radial bearing means.

4,333,677

DEVICE FOR CARRYING AND SECURING SKIS, BOOTS AND POLES

John M. Crump, 1018 Parkridge Cir. W., Jacksonville, Fla. 32211

Filed Feb. 28, 1980, Ser. No. 125,340
Int. Cl.³ A45F *5/10*
U.S. Cl. 294—147 **9 Claims**



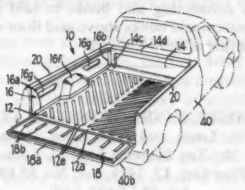
1. A device for the character described comprising a pair of mutually aligned and selectively manipulatable cooperative cradle carriages each slidable mounted in a predetermined relationship relative to a column member, one of said carriages having a pair of oppositely disposed downwardly depending skirts functioning in cooperation with said column member to form ski and pole magazine chambers, said column member disposed at its upper extremity with a hand grasp and at its lower extremity with a base member, said base member cooperating with said column and said skirts to form said ski and pole magazine chambers, means adjustably engaged with said column member whereby both of said carriages may be manipulated one relative to the other for selectively engaging any combination of boots, skis and poles into releasable securement therewith.

4,333,678

TRUCK BED LINER ASSEMBLY

Donald L. Munoz, Warren; Daniel A. Grote, Algonac; David G. Bronder, Rochester, all of Mich., and Gerald J. Weis, Dallas, Tex., assignors to Thermoplastics Incorporated, Prairie View, Tex.

Filed Aug. 13, 1979, Ser. No. 66,096
Int. Cl.³ B62D *33/00*
U.S. Cl. 296—39 R **11 Claims**



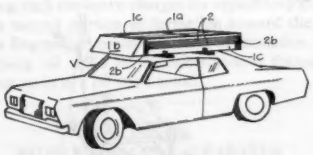
1. A knockdown protective liner assembly for the bed of a pickup truck including a bed floor, a bed front wall, bed side walls and a tail gate, said liner assembly consisting of interconnectible panels comprising: a floor panel for the bed floor and having upstanding flanges at the front and side edges thereof; a front panel for the bed front wall and for overlapping the upstanding flange at the front edge of the floor panel and having an upper outwardly extending flange for overlying the top of the bed front wall, a lower inwardly extending flange for overlapping the front portion of the floor panel, and inwardly extending end flanges; side panels for the bed side walls and for overlapping the upstanding flanges at the side edges of the floor panel and having upper outwardly extending flanges for overlying the tops of the bed side walls, lower inwardly extending flanges for overlapping the side portions of the floor panel and forward inwardly extending end flanges for overlapping the inwardly extending end flanges of the front panel; and fastening means for fastening the front panel to the upstanding flange at the front edge of the floor panel, the forward inwardly extending end flanges of the side panels to inwardly extending end flanges of the front panel and the side panels to the upstanding flanges at the side edges of the floor panel to form a unitary protective liner to be received in the bed of the pickup truck.

4,333,679

VEHICLE TOP TRANSPORTED, SELF CONTAINED CAMPER

Raymond D. Hardy, Rte. 3, Box 147B, Robstown, Tex. 78380, and William E. Van Steenwyk, 3191 Highway 21A, Festus, Mo. 63028

Filed Jan. 7, 1980, Ser. No. 109,868
Int. Cl.³ B60P *3/32*
U.S. Cl. 296—161 **15 Claims**



1. A camper comprising a rigid roof structure mountable for travel atop a vehicle, legs pivoted at their upper ends to said roof structure and swingable from horizontal traveling positions along both sides of said roof structure to generally upright positions supporting said roof structure from the ground, said roof structure mounting vertically movable floor structure

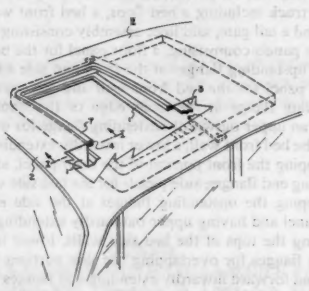
and collapsible intermediate structure stored in collapsed travel position between said roof and floor structures, and selectively controlled means operatively connecting said floor and roof structures and extending said collapsible intermediate structure to operative condition and raising said floor structure to said roof structure and collapsing said intermediate structure into traveling position, said collapsible intermediate structure having flexible walls and including sleeping bunks connected to said flexible walls and resting on said floor structure when the camper is in traveling position, and parallel maintenance linkage means connecting said bunks to said floor structure whereby to position said bunks above said floor structure when said floor structure is fully lowered.

4,333,680

VEHICLE SUNROOF INSTALLATION

Ernest Wolf, St. Louis, and John Amos, Rolla, both of Mo., assignors to Sky-Top Sunroofs Ltd., St. Louis, Mo.

Filed Oct. 17, 1979, Ser. No. 85,889
Int. Cl.³ B60J 7/00
U.S. Cl. 296—216 **14 Claims**



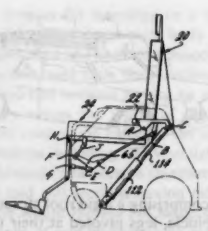
1. In combination
(1) a vehicle having an opening in the roof thereof, and
(2) a sunroof, said sunroof having panel means capable of opening and closing said opening,
the improvement wherein said sunroof is attached to the underside of the vehicle roof by means of an adhesive,
said sunroof being substantially coextensive to said vehicle roof, and
also substantially parallel to the sweep of the vehicle roof in the area of said adhesive attachment.

4,333,681

POWER OPERATED RECLINING WHEELCHAIR

M. Eugene Nelson, 4921 Gary St., San Diego, Calif. 92115

Filed Nov. 16, 1979, Ser. No. 94,729
Int. Cl.³ A47C 1/034
U.S. Cl. 297—83 **12 Claims**



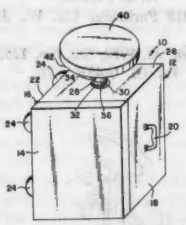
1. A reclining chair comprising:
a frame assembly having a base frame and a pair of laterally spaced side-wall frames extending upwardly from opposite lateral sides of said base frame, each of said sidewall frames having a fixed major pivot point located adjacent its rear end, said major pivot points being substantially co-axial and being located approximately at the hip joint of the occupant of the chair;
a back rest assembly;
a seat assembly;
means for pivotally reclining said back rest assembly about said major pivot points in coordinated movement with said seat assembly during which said seat assembly travels from an initial position to an intermediate-travel position and continues on to a final position wherein:
a. at said initial position the front end and the rear end of said seat assembly are substantially horizontal;
b. at said intermediate-travel position the front end of said seat assembly is tilted upwardly and forwardly advanced from its initial position while its rear end is positioned lower than and forwardly advanced of its initial position, and
c. at said final position the front end and the rear end of said seat assembly are substantially horizontal and at substantially the same vertical height as said front and rear ends in the initial position and said front end and rear end are advanced forwardly from their intermediate-travel position.

4,333,682

SPACE CASE DRUMMERS THRONE COMBINATION

George H. Iser, 94-06 82nd Pl., Ozone Park, N.Y. 11416

Filed Aug. 14, 1980, Ser. No. 177,950
Int. Cl.³ A47C 7/62
U.S. Cl. 297—192 **2 Claims**



1. A storage case, comprising in combination a hollow box, a hinged door on the front of said box, a handle at one side of said box, a plurality of casters at the other side of said box, and an adjustable, removable seat assembly at the top of said box, wherein said top of said box comprises a central aperture, and a ring with a central threaded aperture placed into said top aperture and wherein said seat assembly comprises a seat with a bottom central threaded partial aperture and a vertical shaft threaded on both ends that threads into said bottom of said seat and into said top of said box.

4,333,683

CHAIR WITH AUTOMATICALLY ADJUSTABLE TILTING BACK

Emilio Ambasz, New York, N.Y., assignor to Center for Design Research and Development N.V., Curacao, Netherlands Antilles

Continuation-in-part of Ser. No. 966,123, Dec. 4, 1978, abandoned. This application Jul. 11, 1979, Ser. No. 56,790
Int. Cl.³ A47C 5/12, 7/40
U.S. Cl. 297—292 **18 Claims**

1. A chair comprising a unitary seat and lower back, an upper back, the seat and lower back and the upper back being contoured longitudinally and transversely to conform generally to the anatomical shapes of the parts of a person sitting in

the chair which are supported by the chair, and the lower back and upper back having complementary sockets at each side opening toward each other, and a resilient articulating linkage received in each complementary pair of sockets and mounting the lower back on the upper back for articulation between a resiliently restrained relatively upright position and a backward tilted position about a transverse horizontal axis at a height above the seat corresponding to about the middle of the anatomical back of a person sitting in the chair, at least the medial portion of the upper back being located substantially below the axis about which the upper back articulates, so that the upper back is vertically coextensive with and supports the major part of the anatomical middle back of a person sitting in

the chair from about the waist to about the shoulder blades and the lower medial portion thereof shifts forward when the upper back articulates backward, and each articulating linkage including an upper tubular link and a lower tubular link, each such link having a front wall and a back wall, an axle joining the links for articulation, a spring reaction plate pivotably carried by the axle, and having a leg received within each link, compression springs engaged under compression between the front wall of each link and the respective leg of the spring reaction plate and urging the links about the axle in a direction toward the relatively upright position of the upper back and stop means for establishing the upright position and the full backward tilted position of the upper back.

4,333,684

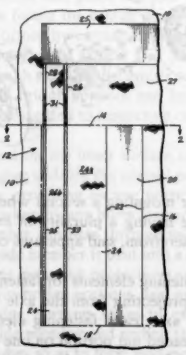
METHOD OF UNIFORM RUBBLIZATION FOR LIMITED VOID VOLUME BLASTING

Thomas E. Ricketts, Grand Junction, Colo., and Bruce B. Redpath, Murphys, Calif., assignors to Occidental Oil Shale Inc., Grand Junction, Colo.

Continuation-in-part of Ser. No. 88,370, Oct. 26, 1979, abandoned. This application Oct. 2, 1980, Ser. No. 193,119

Int. Cl.³ E21B *43/247, 43/263;* **E21C** *41/10*

U.S. Cl. 299—2 **81 Claims**



1. A method for recovering liquid and gaseous products from an in situ oil shale retort in a subterranean formation containing oil shale comprising the steps of:

excavating a first portion of the formation from within the boundaries of the retort being formed to form at least one void, the surface of the formation defining such a void providing at least one free face within the boundaries of the retort being formed, and leaving a second portion of the formation within the boundaries of such retort being formed and extending away from such a free face, such a second portion to be explosively expanded toward such a void;

placing at least two arrays of explosive charges in such a second portion of formation, the first array of explosive charges having a first burden distance measured from such a free face and the second array of explosive charges having a second burden distance measured from the first array of explosive charges, the second burden distance being less than the first burden distance, wherein the equivalent scaled point charge depth of burial of the first array of explosive charges is substantially equal to the equivalent scaled point charge depth of burial of the second array of explosive charges, the first array of explosive charges being closer to the free face than the second array of explosive charges;

detonating such explosive charges for explosively expanding such a second portion of formation toward such a void to form a fragmented permeable mass of formation particles containing oil shale in the subterranean formation for forming an in situ oil shale retort;

introducing gas into the fragmented permeable mass in the in situ oil shale retort for establishing a retorting zone in the fragmented mass wherein oil shale is retorted to produce gaseous and liquid products and for advancing the retorting zone through the fragmented mass; and

withdrawing gaseous and liquid products from the retort.

14. A method for forming an in situ oil shale retort in a retort site within a subterranean formation containing oil shale, such an in situ oil shale retort containing a fragmented permeable mass of formation particles, such a fragmented mass having top, bottom, and side boundaries, comprising the steps of:

excavating a first portion of the formation from within the boundaries of the fragmented mass being formed to form at least one void, a surface of the formation defining such a void providing at least a first free face within the boundaries of the fragmented mass being formed, and leaving a second portion of the formation within the boundaries of such fragmented mass being formed and extending away from such first free face, such second portion to be explosively expanded toward such a void;

placing at least a first and a second array of spaced apart explosive charges in such a second portion of formation, the first array being closer to the first free face than the second array wherein the burden distance of the first array measured from the first free face is greater than the burden distance of the second array measured from the first array of explosive charges; and

detonating such explosive charges for explosively expanding such a second portion of formation toward the void to form a fragmented permeable mass of formation particles containing oil shale in the subterranean formation for forming an in situ oil shale retort.

4,333,685

ROAD SURFACING APPARATUS

Jeffrey K. Arnswald, Olathe, Kans., assignor to Federal-Mogul Corporation, Detroit, Mich.

Filed Jun. 9, 1980, Ser. No. 157,945

Int. Cl.³ E01C *23/09*

U.S. Cl. 299—39 **18 Claims**

1. An elongated roadway surfacing machine comprising:

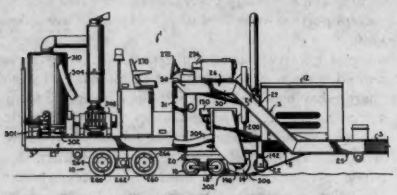
(a) a rigid main frame having front and rear ground engaging support wheels, means driving at least certain of said

support wheels for moving said main frame forwardly along a surface;

(b) a sub-frame mounted on said main frame between said front and rear wheels and adapted to move vertically with respect to said main frame;

(c) a cutter head rotatably mounted on said sub-frame transversely of said main frame;

(d) depth of cut control means vertically adjustably mounted



on said sub-frame rearwardly of said cutter head and engaging the cut behind said cutter head for controlling the depth of cutter head displacement into said surface;

(e) weight transfer means connected between said main frame and said sub-frame forwardly of said depth of cut control means; and

(f) a prime mover operably engaged with said cutter head to provide rotational motion thereto during forward motion of said main frame.

4,333,686

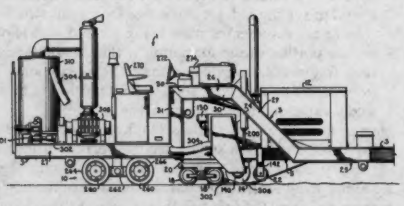
ROAD PLANER DEVICE WITH AUXILIARY OUTRIGGER DEPTH CONTROL WHEELS

Jeffrey K. Arnswald, Olathe, Kans., assignor to Federal-Mogul Corporation, Detroit, Mich.

Filed Jun. 9, 1980, Ser. No. 157,959

Int. Cl.³ E01C *23/09*

U.S. Cl. 299—39 **7 Claims**



1. In a road surface planing device having a rigid main frame, said device being adapted for planing sequential, adjacent, multiple swaths along a road surface;

(a) a sub-frame pivotally mounted on said main frame for upward and downward pivotal movement of said sub-frame relative to said main frame; a cutter head mounted on said sub-frame;

(b) depth control means located rearwardly of said cutter head and engaging the cut swath provided by said cutter head;

(c) adjusting means operably mounted between said sub-frame and outrigger control device to selectively lock said outrigger control device into fixed relation with said sub-frame and contact with said previously cut swath surface for supporting said sub-frame such that said cutter head is retained at an elevation cutting said subsequent swath coplanar with said previously cut swath.

4,333,687

HOLDER FOR THE ATTACHMENT OF CUTTERS TO MINING AND TUNNELLING MACHINES

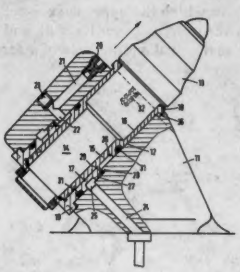
Ingo Barnstorf, Frankfurt, Fed. Rep. of Germany, assignor to Kennametal Inc., Latrobe, Pa.

Filed Aug. 11, 1980, Ser. No. 177,070

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1978, 2854307

Int. Cl.³ E21C *35/22*

U.S. Cl. 299—81 **13 Claims**



1. A holder for the attachment of cutters, in particular, circular shank cutters, to mining and tunnelling machines, which has at least one spray nozzle for coolant spraying of the bit working area, the coolant supply for which is in controlled dependence upon an application of a pressure load to the cutter, comprising: means for receiving said cutter shank in said holder; an insert sleeve surrounding said cutter shank inserted with axial play in said means for receiving said cutter shank; a shut-off member, carried on said insert, which engages into a coolant supply line to said spray nozzle when a pressure load is applied to said cutter and shuts off said coolant supply when there is no load on said cutter.

4,333,688

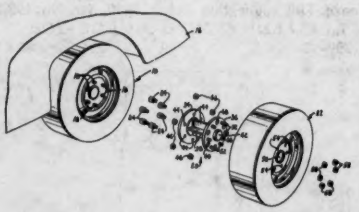
MOUNTING ARRANGEMENT FOR DUAL WHEELS

Ernest M. Lemmon, P.O. Box 569, Arkoma, Okla. 74901, and James P. Pettigrew, 6815 S. 9th St., Fort Smith, Ark. 72901

Filed May 9, 1980, Ser. No. 148,462

Int. Cl.³ B60B *11/00*

U.S. Cl. 301—36 R **4 Claims**



1. Apparatus for mounting a second wheel to a first wheel carried on an axle having a plurality of externally threaded studs projecting therefrom, said apparatus comprising in combination:

a plurality of fastening elements for fastening the first wheel on the studs projecting from the axle to secure the first wheel to the axle, each fastening element including an internally threaded nut portion on one end adapted to be threaded onto the corresponding stud to secure the first wheel thereon and a solid externally threaded shank on the opposite end integral with said nut portion and pro-

jecting outwardly therefrom to provide an outward continuation of the corresponding stud;

an adapter having a body portion and flat first and second flanges on opposite ends of said body portion, said first flange having a plurality of openings therein for receiving the corresponding shanks of said fastening elements to mount said adapter on said shanks;

a plurality of nut elements adapted to be threaded onto the externally threaded shanks and against said first flange to secure said adapter on said fastening elements; and

means for mounting the second wheel on said second flange with the second wheel located outwardly of the first wheel, said mounting means including a plurality of externally threaded bolt members projecting from said second flange and a plurality of nuts adapted to be threaded onto said bolt members to secure the second wheel thereon.

4,333,689

CONNECTION DEVICE FOR SPACED ELECTRIC COMPONENTS

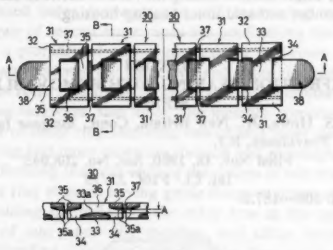
Hitoshi Fujino, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 970,642, Dec. 18, 1978, abandoned. This application Sep. 23, 1980, Ser. No. 190,023

Claims priority, application Japan, Dec. 16, 1977, 52/169120

Int. Cl.³ F16C *29/00*; H01H *3/00, 3/12*

U.S. Cl. 308—3 R **5 Claims**



1. A connection member for interconnecting spaced electric components for operating one component remotely by actuation of the other, comprising

a guide member formed of a resilient material and defining a generally flat tubular pathway adapted to extend in either a curved or straight path between said components;

said pathway having windows and bridge portions extending laterally across said guide member with the windows on one surface facing the bridge portions of the other;

a slide member formed by cutting a plate of a resilient material to a predetermined width, said slide member being insertable through said guide member to ride on the inner surfaces of said bridge portions and having end portions adapted to be connected to respective ones of said components;

and means formed on the inner surface of said bridge portions for engaging slidably the central portion of said slide member while providing escape portions for the lateral edges thereof whereby any burrs formed during cutting of said slide member can pass through said escape portions even if said guide member is bent into a curved configuration, said means including projections extending inwardly of the respective bridge portions, said projections running along the bridge portions so as to extend transversely across said guide member and ending short of the sides of the guide member so as to form said escape portions; said projections each having a surface curved in the longitudinal direction of said guide member.

4,333,690

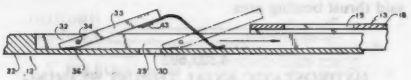
SLIDE MECHANISM

Tom Keefe, Stony Point, and Bruno Rosellini, Orangeburg, both of N.Y., assignors to Grant Industries Incorporated, West Nyack, N.Y.

Filed Jan. 12, 1981, Ser. No. 224,632

Int. Cl.³ F16C *29/10*

U.S. Cl. 308—3.8 **10 Claims**



1. A slide structure comprising a pair of first and second longitudinal slide members mutually relatively longitudinally slidable between relatively extended and contracted positions, said first slide member having a first stop defining face and a first stop member located on and longitudinally movable with said second slide member and transversely movable between an inwardly retracted position toward said second slide member out of the relative path of movement of said first stop and an advanced position at least in said path of movement and being spring biased to an advanced position and including a second stop defining face facing toward said first stop and a cam surface extending from said second stop toward said first stop and inwardly inclined toward said first stop whereby with relative longitudinal movement of said slide members said first stop engages said cam surface to retract said stop member to a position with said second stop in said first stop relative path of movement.

4,333,691

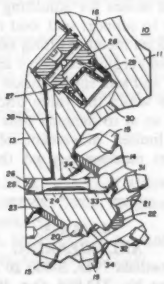
ROTARY ROCK BIT WITH IMPROVED THRUST FLANGE

Thomas W. Cooper, Mansfield, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 9, 1980, Ser. No. 195,468

Int. Cl.³ F16C *33/10, 33/66*; E21B *10/22*

U.S. Cl. 308—8.2 **3 Claims**



1. An improved earth boring bit having a bit body defining a downwardly extending arm with a downwardly, inwardly extending bearing pin, a rolling cone cutter rotatably mounted on said arm, said arm and cone defining cooperating engaging surfaces extending radially with respect to the axis of said pin providing facing engaging thrust bearing areas for the thrust forces between said bit body and said cone, and lubricant disposed between said surfaces to reduce the friction and wear as said cone rotates thereon, and wherein said cooperating radially extending surfaces define a first annular surface on said cone and a mating second annular surface on said pin, said first surface terminating inwardly at an inner shoulder extending away from said arm and outwardly at a second shoulder extending above said first surface toward said arm, said improvement comprising:

a plurality of slots in said first annular surface, said slots open to said inner shoulder and terminating closely adjacent said second shoulder and extending from said inner shoulder to said termination point generally in the direction of rotation of said cone, whereby

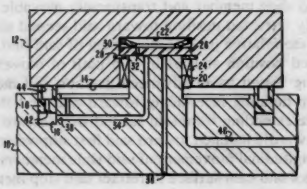
lubricant migrating outwardly from between said facing thrust bearing surfaces is continuously scraped into said slots and forced back toward the inner shoulder of the annular bearing area for replenishing lubricant to the radially inner area of said thrust bearing area.

4,333,692

HYDROSTATIC AXIAL THRUST BEARING

Charles E. Kraus, Austin, Tex., assignor to Excelermatic Inc., Austin, Tex.

Filed Dec. 5, 1980, Ser. No. 213,414
Int. Cl.³ F16C *32/06*
U.S. Cl. 308—9 **8 Claims**



1. A hydrostatic axial thrust bearing comprising: a support member; a load member disposed opposite said support member with a bearing cavity formed therebetween, said load member having a central cavity, a valve disc seated in said cavity and being axially movable therein, spring means disposed in said cavity and forcing said valve disc into a seated position, said support member having a vent passage extending therethrough and having an opening below said valve disc, a bearing cavity seal ring disposed in a groove formed in one of said support and load members and being axially movable therein, said seal ring defining the circumferential limits of said bearing cavity, and means for admitting pressurized fluid to said bearing cavity to support said load member on said support member, said load member lifting said valve disc off said vent opening for discharging excessive amounts of fluid from said bearing cavity and said spring means providing increased vent closing forces while the valve disc is unseated during sudden load peaks so as to dampen peak bearing load forces while permitting limited movement of the load member toward the support member beyond the normal operating position.

4,333,693

AXLE BEARING

Axel H. Sjöbom, Postlada 7919, S-860 20 Njurunda, Sweden

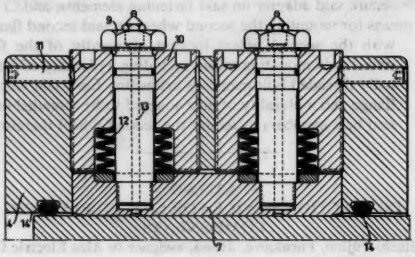
Continuation of Ser. No. 733,954, Oct. 19, 1976, abandoned. This application Apr. 25, 1978, Ser. No. 899,796
Claims priority, application Sweden, Nov. 6, 1975, 7512455
Int. Cl.³ F16C *19/00*
U.S. Cl. 308—176 **10 Claims**

1. An axle bearing including a stationary outer bearing housing and an inner bearing housing adapted to receive a radial bearing, said inner bearing housing being axially movable within said outer bearing housing, wherein the improvement comprises:

a first support member fixably secured to said outer bearing housing in one half of said outer housing for supporting said inner bearing housing;

a second support member in the opposed half of the outer bearing housing, said second support member being radially movable with respect to said outer housing, and said second support member including a contact surface for contacting a complementary contact surface of said inner bearing housing;

an adjusting member adjustably connected to said outer bearing housing for supporting said second support member for relative radial movement with respect to said adjusting member, said adjusting member providing a limit for limiting the radial movement of said second support member away from said inner bearing housing;



means for biasing said second support member towards said inner bearing housing; and

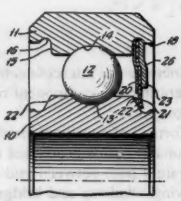
lubricating means for lubricating said contact surfaces of said inner bearing housing and said second support member to permit free sliding movement between said support member and said inner bearing housing.

4,333,694

ANTIFRICTION BEARING WITH REMOVABLE SEAL MEANS

Ralph S. Howe, Jr., New Britain, Conn., assignor to Textron Inc., Providence, R.I.

Filed Nov. 18, 1980, Ser. No. 208,043
Int. Cl.³ F16C *33/78*
U.S. Cl. 308—187.2 **9 Claims**



1. A sealed antifriction bearing wherein the bearing comprises inner and outer race rings with interposed antifriction elements riding the races of said rings, the outer ring having a circumferentially continuous radially inwardly open seal-retaining groove of continuously curved sectional contour between an axially inner abutment shoulder and an axial-end land of diameter greater than the inner diameter of said shoulder, the axially outer end of said groove contour being characterized by a ramp substantially tangent to said continuously curved contour, said inner ring having a sloping seal surface in substantially axial registry with said groove, said ramp converging toward said land in the axially outward direction; and seal elements comprising a first stiff annular backing ring of diameter to clear said land and in abutment with said shoulder, said backing ring having clearance with said inner race ring, an annular seal ring of yieldable material in radially overlapping abutment with said backing ring and having yielding circumferentially continuous seal contact with said seal surface, and a split otherwise annular cap ring of stiffly compliant material of unstressed outer diameter intermediate the diameter of said

land and the groove-bottom diameter, said cap ring compressionally abutting said seal ring and having an axially outer and radially outer corner bevel in wedging engagement with said ramp.

4,333,695

ROLLER BEARING

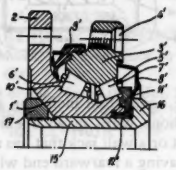
Terence A. Evans, 37 the Coppins, Ampthill, England

Continuation of Ser. No. 944,969, Sep. 22, 1978, abandoned. This application Jul. 28, 1980, Ser. No. 172,550

Claims priority, application Netherlands, Sep. 28, 1977, 7710564

Int. Cl.³ F16C *19/28, 25/06*

U.S. Cl. 308—211 **7 Claims**



1. A hub bearing assembly comprising a first outer annular ring and an inner ring member, the outer ring having a pair of axially spaced outer raceways and said inner ring member having a pair of spaced inner raceways confronting the outer raceways, a plurality of rollers arranged in two rows in the annular space between the outer ring and inner ring member, said rows of rollers separated by cages and in line contact with said bearing raceways, said inner ring member comprising at least a pair of inner ring elements, one of said inner ring elements having said inner raceways thereon and an integral first flange confronting the axial ends of the rollers of one row, the other inner ring element having guide flange means confronting and guiding the rollers of the other row at the opposite axial end of said inner ring member, said other inner ring element extending axially so that its outer free terminal end opposite said guide flange means is disposed adjacent said first flange of said one inner ring element, sealing means fastened at one axial end to said outer annular ring and means including a detachable retaining member cooperable with the terminal end of said other ring element for securing said inner ring elements in assembled relation and providing a means for preloading said bearing.

6. A hub bearing assembly comprising a first outer annular ring and and inner ring member, the outer ring having a pair of axially spaced outer raceways and said inner ring member having a pair of spaced inner raceways confronting the outer raceways, a plurality of rollers arranged in two rows in the annular space between the raceways of said outer ring and inner ring member, said rows of rollers separated by cages and in line contact with said bearing raceways, said inner ring member comprising at least a pair of inner ring elements, one of said inner ring elements having an integral first flange confronting the axial ends of the rollers of one row, the other ring element having a guide flange at one axial end opposite said integral first flange of said one ring member and extending axially so that its terminal end is disposed adjacent said first flange, an annular bearing component engaging between the guide flange of said other ring member and confronting and adapted to engage the axial ends of the rollers of said other row of rollers, a nut member threadedly engageable on the outer terminal end of said other ring element and engageable with said one ring element, actuation of said nut member in one direction operable to prestress the rollers through said annular bearing component in an axial direction to take up undesirable play in the bearing.

4,333,696

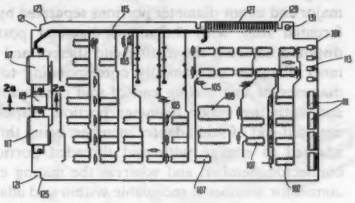
PLURAL EDGE P.C. BOARD INTERCONNECTION

Joseph L. O'Neill, Haddonfield, N.J., and Christopher J. Scafidi, Marlton, N.J., assignors to Infotron Systems Corporation, Cherry Hill, N.J.

Filed Jun. 19, 1980, Ser. No. 160,846

Int. Cl.³ H05K *1/00*

U.S. Cl. 339—17 LM **15 Claims**



1. An electrical signal interconnection apparatus providing interface connections and inter-component connections for an expandable capacity unit cabinet containing a plurality of said components, comprising:

first means, associated individually with each of said plural components, for making inter-component electrical signal connections, said first signal connection means being located at a first separate location on each said component;

means for adjustably mating with each said first signal connection means for providing inter-component signal connections, said signal connection mating means be fixedly and structurally associated with said cabinet and capable of expanded capacity mating and inter-component connections;

means for removably receiving, and positioning said expandable number of plural components;

second means, associated individually with each of said plural components, for making cabinet external interface signal connections, said second interface signal connection means being located at a second separate location on each said component,

means for lockably engaging each said component for securedly holding same in said cabinet, and

means for positioning and securedly holding interface signal connectors externally to said cabinet for mating with said second signal connection means.

4,333,697

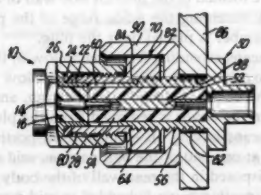
ADAPTER FOR A COAXIAL CONNECTOR

Charles W. Dreyer, Fairfield, Conn., assignor to Sealectro Corporation, Mamaroneck, N.Y.

Filed Jul. 14, 1980, Ser. No. 168,623

Int. Cl.³ H01R *13/00*

U.S. Cl. 339—31 R **6 Claims**



1. A coaxial connector comprising:

a connector member having a mating end and including a central conductor surrounded by a tubular insulator and a generally cylindrical outer conductor, said outer conduc-

tor having a threaded portion spaced from said mating end, said mating end including a plurality of longitudinally extending slits defining a plurality of cantilevered spring fingers, with the diameter of said mating end of said outer conductor being less than the diameter of said threaded portion; and

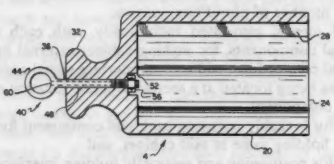
an adapter member of elongated, cylindrical configuration having a mating end, with the outer surface of said adapter being threaded, and with the inner surface thereof having major and minor diameter portions separated by a circumferential step, with the minor diameter portion being disposed adjacent the mating end thereof and having an inner diameter substantially corresponding to the outer diameter of said mating end of said conductor member, and with the major diameter portion, disposed at the opposed end of said adapter member, being threaded and adapted to engage with said threaded portion of said connector member, and wherein the mating end of said connector member is receivable within said adapter member, with the threaded portion of said connector member being threadably engaged with the threaded major diameter portion of said adapter member, such that the distal end of said threaded portion abuts said circumferential step of said adapter member whereby the configuration of the mating end of said connector member is altered.

4,333,698

COVER FOR TRUCK/TRAILER MALE ELECTRICAL PLUG

Leroy Herbert, 70 E. 100 North, Bountiful, Utah 84010

Filed Apr. 11, 1980, Ser. No. 139,163
Int. Cl.³ H01R *13/52*
U.S. Cl. 339—36 **2 Claims**



1. A cover for a truck/trailer electrical plug which has predetermined exterior side wall demensions and a guide ridge protruding from the side wall and extending longitudinally therealong said the cover including

a hollow body member made of a resilient material and formed with an opening in the front end thereof for receiving a plug, the interior sidewall deminisions of the hollow being substantially the same as the exterior side wall dimensions of the plug, said body member including a groove formed in the interior side wall of the hollow for slidingly receiving the guide ridge of the plug when the body member is placed over the plug,

channel means extending from the hollow of the body member through a rear wall thereof to allow escape of air when the cover is placed over the plug, and the entry of air when the cover is removed from the plug, and an

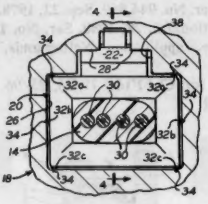
eyebolt means having an elongate bolt portion and eyelet formed at one end of the bolt portion, said eyebolt means being disposed in the rear wall of the body member with the bolt portion being imbedded in said rear wall and the eyelet being positioned outside the body member, said eyebolt means including a hollow channel formed in the bolt portion to extend the full length thereof to allow communication between the interior and exterior of the body member.

4,333,699

FLAT TELEPHONE CORD PLUG IMPROVEMENTS

William J. Brorein, Whippany, N.J., assignor to GK Technologies, Incorporated, Greenwich, Conn.

Continuation of Ser. No. 870,586, Jan. 18, 1978, abandoned. This application Sep. 10, 1979, Ser. No. 74,136
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—61 M **15 Claims**



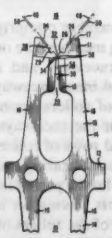
1. A telephone connection including a miniature plug for connecting telephone wires in an opening in a jack of the telephone handset or a wall jack that has an opening with side walls, said plug having a rearward end with an entrance opening therein for receiving a cord having a plurality of conductors therein, outlet openings near the other end of the plug for circuits from the conductors in the cord, protuberances normal to the longitudinal sides of the plug and at spaced positions around the perimeter of said plug, said protuberances having bases immovably secured to the plug immediately beneath them and being somewhat greater in height than a clearance between the walls of the plug and the walls of the opening in the jack into which the plug is intended to be inserted, said walls of the jack opening being in fixed relation to one another whereby the protuberances wedge the plug against movement in all directions transverse of the direction in which the plug is inserted into the opening in the jack.

4,333,700

INSULATION-PENETRATING SLOTTED BEAM CONTACT ELEMENT

William E. Pugh, III, Andover, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 23, 1980, Ser. No. 152,721
Int. Cl.³ H01R *4/02*
U.S. Cl. 339—97 R **19 Claims**



1. A slotted beam contact element (10,110) for electrically terminating an insulated conductor (220) comprised of a conductor (202) surrounded by a jacket of insulation (224), where the contact element is a substantially planar conductive structure comprising a base portion (12), a bifurcated beam (14) with substantially parallel furcations (16,116) extending from the base portion where the furcations define between them a substantially V-shaped wire-guiding entrance (18,118) near the free ends (17,117) of the furcations, and a wire-gripping slot (20,120) formed with facing furcation sidewalls (30,126) where

the sidewalls at their ends adjacent the entrance form a mouth (32,128) to the slot, the contact element being characterized by:

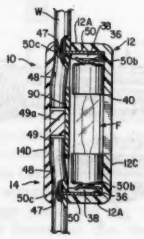
means for removing outer-insulation portions (228) from the insulation of the insulated conductor as the insulated conductor is guided toward the wire-gripping slot, the outer-insulation removing means being disposed at a predetermined location remote from the mouth and along the entrance, said outer-insulation removing means comprising a cutting edge on each furcation (16,116) substantially normal to the plane of the contact element, the cutting edge being defined by an intersection of a ledge (34,134) formed from a first coined region (11,130) on a first face (13,132) of the contact element with its associated entrance sidewall (26,124).

4,333,701

IN LINE CARTRIDGE TYPE FUSE HOLDER

Henry Schick, Commack, N.Y., assignor to Gilbert Mfg., Co., Inc., Long Island City, N.Y.

Continuation-in-part of Ser. No. 54,001, Jul. 2, 1979, abandoned.
This application May 1, 1981, Ser. No. 259,587
Int. Cl.[3] H01R *13/38*
U.S. Cl. 339—97 P 10 Claims



1. An in-line holder for cartridge type fuses of the type which are elongated and have an electrically conductive piece at each end and a central section of electrically insulating material comprising:

an elongated body of an electrically insulating material formed by first and second sections,

means formed in said first section adapted for holding a current carrying insulated line having one conductor which is cut leaving two spaced opposing ends,

a terminal contact mounted in and adjacent each end of said second section in spaced relatlinship at a distance to permit the cartridge fuse to be removably held therebetween, each said terminal contact including means adapted for holding and making electrical contact with a respective conductive piece of the cartridge type fuse located between the terminal contacts, each of said terminal contacts also having formed thereon a barbed end for extending into said first section when the two sections are juxtaposed and each barbed end adapted to pierce through the insulation of the cut conductor of the insulated line held in said first section at a respective one of its cut ends to make electrical contact with the current carrying wire therein,

said first and second sections being formed as an integral unit with hinge means for connecting said two sections,

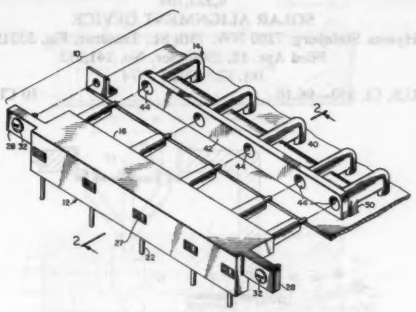
and coacting fastening means formed on the exterior of said first and second sections for holding said two sections juxtaposed together with the barbed end of each terminal contact in a position in said first section to pierce through the insulation of the respective corresponding end of the cut conductor to place the fuse held in said second section in the cut line, separation of the two sections removing said terminal contacts from the cut conductor ends and thereby removing current from the cartridge fuse.

4,333,702

LOW COST HIGH VOLTAGE CONNECTOR

Henry O. Herrmann, Jr., Elizabethtown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 24, 1980, Ser. No. 133,368
Int. Cl.[3] H01R *13/627*
U.S. Cl. 339—217 R 12 Claims



1. A high voltage connector comprising:

a plug member having a housing defining a plurality of cavities therein, a plurality of inserts each received in a respective cavity, each insert having an intersecting bore and channel;

a like plurality of terminals each terminating a respective wire with said terminal being mounted in said bore and said wire extending through said channel; and

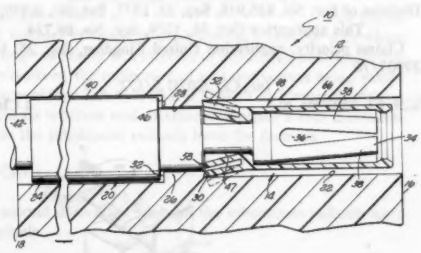
a header having a mating face, a plurality of bores in said mating face, a cavity intersecting each said bore, and a terminal snap fitted into said cavity to such position where it can be engaged by a respective terminal in said plug member extending through said bore, and means for mounting said header on a circuit board or the like.

4,333,703

CONTACT RETENTION ASSEMBLY

John W. Anhalt, Orange, and Steven Z. Muzslay, Huntington Beach, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 19, 1980, Ser. No. 151,307
Int. Cl.[3] H01R *4/24*
U.S. Cl. 339—217 S 13 Claims



1. A front release contact retention assembly comprising:

an insulator having a passage extending therethrough from a front face to a rear face thereof;

said passage having a forwardly facing shoulder therein;

a contact mounted in said passage having an annular groove therein in front of said shoulder;

a plastic retention ring mounted on said contact, said ring embodying inner and outer rearwardly extending circular skirts, said outer skirt surrounding said inner skirt;

said inner skirt lying in said groove to retain said ring axially on said contact; and

said outer skirt being radially deflectable and extending outwardly to engage said shoulder to thereby restrict rearward movement of said contact in said passage.

4,333,704

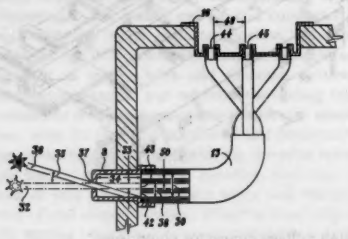
SOLAR ALIGNMENT DEVICE

Hyman Steinberg, 7200 NW. 78th St., Tamarac, Fla. 33319

Filed Apr. 18, 1980, Ser. No. 141,313

Int. Cl.³ G02B *5/14*

U.S. Cl. 350—96.10 **10 Claims**



1. On a solar grill, including an outer frame defining an opening in which an essentially flat collector plate is disposed within the frame, a display device for indicating the position of the sun, relative to a position which is perpendicular to the collector plate of such grill, comprising:

an enclosure with an aperture at one end and an opening at the other end operably connected to pass light therebetween, said enclosure connected to said outer frame with the said aperture parallel to the plane of said collector plate;

a flexible, light-transmitting cable having one end connected to said opening, below said aperture, said enclosure having light-absorbing interior walls and said enclosure connected to said grill frame, and

said cable having a display end connected to said frame at a location suitable for viewing.

4,333,705

JIG FOR COUPLING OF OPTIC-WAVEGUIDE ELEMENTS

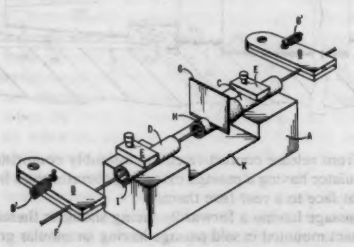
John F. Mead, Princes Risboro, England, assignor to Plessey Mandel und Investments A.G., Zug, Switzerland

Division of Ser. No. 835,918, Sep. 23, 1977, Pat. No. 4,195,045. This application Oct. 31, 1979, Ser. No. 89,724

Claims priority, application United Kingdom, Sep. 25, 1976, 39905/76

Int. Cl.³ G02B *5/172*

U.S. Cl. 350—96.20 **4 Claims**



1. A jig for the accurate attachment of a surrounding sleeve to an optical fibre including means for detachably mounting in accurate axial alignment with each other a precision-made accurate axial alignment with each other, a precision-made cylindrical sleeve which is to be attached to the fibre, and which is closed at one end by an end wall having a coaxial bore closely fitting the fibre and, at an axial distance from this sleeve, a second cylindrical sleeve of similar construction; and means for releasably applying longitudinal tension to a length of fibre which has been threaded through the bores in the respective end walls of the two thus mounted cylindrical sleeves, and which extends through the whole length of at least the first-mentioned sleeve, said jig being further equipped with means for guiding a knife blade to a position at which it engages the fibre, in a plane normal to the fibre, at a predetermined point between the two mutually facing ends of the cylinder sleeves.

4,333,706

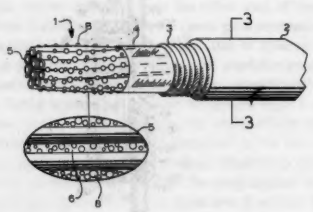
FILLING MATERIALS FOR COMMUNICATIONS CABLE

Lawrence E. Davis, Hickory, and Naren I. Patel, Valdese, both of N.C., assignors to Siecor Corporation, Hickory, N.C.

Continuation-in-part of Ser. No. 106,866, Dec. 26, 1979, abandoned. This application May 2, 1980, Ser. No. 146,339

Int. Cl.³ B32B *17/00*; G02B *5/16*; H02G *15/20*

U.S. Cl. 350—96.23 **16 Claims**



1. A cable comprising a plurality of conductors arranged to define a plurality of interstices therebetween, a jacket circumferentially surrounding said conductors, the improvement comprising a cable filler mixture disposed of said interstices, said mixture comprising 62 to 95 weight percent petrolatum, 1 to 8 weight percent low molecular weight polyethylene and 1 to 35 weight percent inorganic hollow micropheres having a particle density from 0.12 to 0.6 gms/cm^3 and diameters up to 325 microns, said polyethylene being dissolved in said petrolatum.

4. A cable comprising a plurality of conductors arranged to define a plurality of interstices therebetween, a jacket circumferentially surrounding said conductors, the improvement comprising a cable filler material disposed in said interstices, said material comprising 60 to 98 weight percent petrolatum, 1 to 15 weight percent glycerol hydroxy stearate and 1 to 39 weight percent inorganic hollow microspheres having a particle density from 0.12 to 0.6 gms/cm^3 and diameters up to 325 microns, said glycerol hydroxy stearate being dissolved in said petrolatum.

4,333,707

METHOD OF IMAGE ENHANCEMENT

Laurice J. West, 24 Morningside Dr., Yardley, Pa. 19067

Continuation-in-part of Ser. No. 32,729, Apr. 23, 1979, abandoned. This application Sep. 18, 1980, Ser. No. 188,340

Int. Cl.³ G02B *27/22*; H04N *9/54, 5/72*

U.S. Cl. 350—144 **2 Claims**

1. A method of viewing a substantially two-dimensional visual image in an image plane comprising the steps of: locating optical bending means in a path through which said image is viewed by an observer at a position between said image plane and said observer such that any two rays emanating from substantially any point on said image plane pass through said

optical bending means and diverge in the place between said observer and said bending means; maintaining substantially the same perceived overall image size for both the eyes of the observer with said optical bending means; and selectively bending light rays extending from said image plane to the eyes of the observer, using said optical bending means, so that, for substantially any two horizontally spaced points in the image plane, the left and right eyes of the observer perceive a different horizontal spacing between said points; in which said selective bending step is carried out by optical bending means in the form of a transparent sheet having a refractive index higher

than that of air and having undulating horizontal cross-sections, and in which the distance h between the high points of the peaks and the low points of the adjacent valleys of the undulations is at least approximately ten times greater than sd_1/d_2 where s is the interocular spacing of the observer, d_1 is the closest distance between the image plane and the surface of the optical bending means nearest the image plane, and d_2 is the distance between the image plane and the observer, and in which the undulations are formed so that the effective focal length at substantially any location on the surface of the optical bending means is at least approximately 400 mm.

4,333,708

MECHANICALLY MULTISTABLE LIQUID CRYSTAL CELL

Gary D. Boyd, Rumson; Julian Cheng, Little Silver, and Peter D. T. Ngo, Colts Neck, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 30, 1979, Ser. No. 98,976

Int. Cl.³ G02F *1/133*

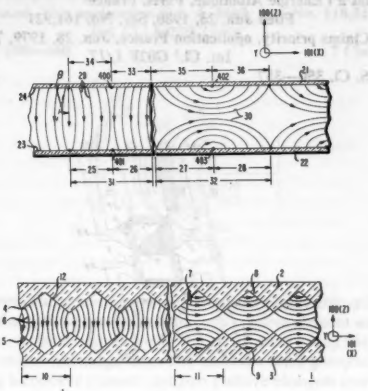
U.S. Cl. 350—346 **27 Claims**

1. A mechanically bistable liquid crystal cell comprising a liquid crystal material having orientational directors disposed between a first substrate surface of a first substrate and a second substrate surface of a second substrate, said first substrate surface and second substrate surface being substantially planar and parallel to each other, said liquid crystal material being mainly in the nematic mesophase;

characterized in that

said first and second substrate surfaces being fabricated such that the directors adjacent to each surface are parallel aligned and the alignments alternate from a positive angle to a negative angle with respect to a normal to each substrate surface, which normal points into said liquid crystal material, the angle being between 22.5 and 67.5 degrees;

the boundary provided by said first and second substrate surfaces contains at least two singular points of orientational alignment in a plane perpendicular to said substrate surfaces where said alignments alternate from a positive angle to a negative angle, one of said two singular points serving as the source of a disclination which can be moved by an externally applied field and the other one of said two



singular points serving as the point at which the disclination can be pinned after it has completed its movement.

4,333,709

MIXTURE OF DISC-LIKE LIQUID CRYSTALS, ELECTRO-OPTICAL DEVICE USING SUCH A MIXTURE AND PROCESS FOR ORIENTING THE MOLECULES OF THE MIXTURE

Jean-Claude Dubois; Annie Zann; Jean Billard, and Michel Hareng, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 3, 1980, Ser. No. 212,598

Claims priority, application France, Dec. 7, 1979, 79 30121; Feb. 22, 1980, 80 03977

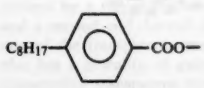
Int. Cl.³ C09K *3/34*; G02F *1/13*

U.S. Cl. 350—350 R **11 Claims**

1. A mixture of liquid crystals having a nematic mesophase consisting essentially of a mixture of hexasubstituted triphenylene derivatives, the molecules of said derivatives being substituted in positions **2**, **3**, **6**, **7**, **10** and **11** with six identical substituent radicals wherein said mixture comprises a first derivative wherein the substituent radicals have the formula

$$C_7H_{15}—COO—$$

and a second derivative wherein the substituent radicals have the formula

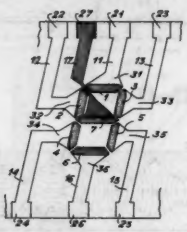


wherein the proportions of said first derivative and said second derivative are chosen so that the nematic mesophase exists over a temperature range useful in a liquid crystal electro-optical display device.

4,333,710
ELECTRODE SYSTEM FOR ELECTROLYTIC DISPLAY MEANS WITH SEVEN SEGMENTS

Jacques Duchene, Saint Ismier, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 23, 1980, Ser. No. 161,921
Claims priority, application France, Jun. 28, 1979, 79 16740
Int. Cl.[3] G02F 1/17
U.S. Cl. 350—357 3 Claims

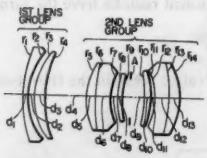


1. A system of electrodes for electrolytic display means with seven segments, comprising on one wall seven electrodes constituted by a first thin transparent conductive film in the form of a segment having two large sides, said electrodes being subdivided into six peripheral electrodes and one central electrode, each electrode being connected to a second thin conductive film deposited on said wall and forming a current lead, each current lead being connected to a connector, wherein each lead comprises a constricted zone followed by an enlarged zone leading to one of the large sides of one of the electrodes, the constriction relative to the current lead associated with the central electrode being positioned between two adjacent peripheral electrodes.

4,333,711
ZOOM LENS FOR COPYING

Takayuki Itoh, Tokyo; Ryota Ogawa, Kawagoe, and Yasunori Arai, Asaka, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1980, Ser. No. 154,261
Claims priority, application Japan, Jun. 20, 1979, 54-77925
Int. Cl.[3] G02B 15/14
U.S. Cl. 350—426 1 Claim



1. A zoom lens for a copying system comprising, in order from the object side, a first lens group having a negative focal length and a second lens group having a positive focal length, the distance between said first and second lens groups being variable while the distance between the object surface and the image surface is maintained constant, movement of said first lens group being primarily to maintain constant the distance between the object and image surfaces and movement of said second lens group serving primarily a variator effect, said first lens group comprising a first negative meniscus lens convex toward the object and a first positive meniscus lens convex toward the object, said second lens group comprising a fixed focus lens used for copying and a diaphragm, said fixed focus lens comprising, in order from said diaphragm, a second positive meniscus lens concave toward said diaphragm, a second negative meniscus lens concave toward said diaphragm and a third positive meniscus lens concave toward the object, said third positive meniscus lens and said second negative meniscus lens being cemented to one another, said second and third positive meniscus lenses and said second negative meniscus lens being disposed on the object side of said diaphragm and, in order from said diaphragm, a fourth positive meniscus lens concave toward said diaphragm, a third negative meniscus lens concave toward said diaphragm, and fifth positive meniscus lens concave toward said diaphragm, said fifth positive meniscus lens and said third negative meniscus lens being connected to one another, said fourth and fifth positive meniscus lenses and said third negative meniscus lens being disposed on the image side, and said zoom lens satisfying the following conditions:

$F_\infty = 5.6$ $f = 247.2 - 255.0$

$NA = 0.0523 \sim 0.0446$ $M = -1/\sqrt{2} \sim -1$

$\omega = 14.17° \sim 16.26°$

Surface No.	r	d	N	ν
1	98.943	5.00	1.51633	64.1
2	54.662	6.09		
3	54.954	9.99	1.51112	60.5
4	81.487	38.06 ~ 5.00		
5	53.339	9.01	1.69350	53.2
6	167.595	12.42	1.61293	37.0
7	41.833	7.10		
8	65.070	4.50	1.60311	60.7
9	110.597	19.91		
10	−149.268	5.00	1.60311	60.7
11	−76.765	5.74		
12	−43.201	12.51	1.57309	42.6
13	−107.943	9.07	1.67790	55.3
14	−60.832			

$M_{max}/M_{min} = 1.414$
$|f_I|/f_{min} = 5.1$
$r_{IP}/f_{min} = 0.222$
$\Delta D_{I,II}/f_{min} = 0.134$
$D_{I\sim A}/f_{min} = 0.393$

4,333,712
CHANGE-OVER DEVICE FOR ZOOM LENS

Yasumasa Tomori, Sakada, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 1, 1980, Ser. No. 136,211
Claims priority, application Japan, Apr. 16, 1979, 54/46513
Int. Cl.[3] G02B 7/10
U.S. Cl. 350—430 5 Claims

1. A zoom lens, including a stationary lens mount for attachment to a camera, wherein a zooming operation is carried out by moving a single normal operational barrel along an optical axis and a focusing operation of a front lens group is carried out by the rotation of the single normal operational barrel around the optical axis, comprising:

a plurality of lens groups including said front lens group for focusing and second and third lens groups for zooming;

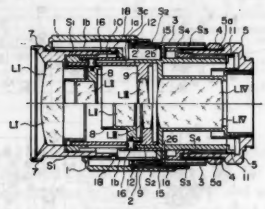
cooperating means for rotating said single normal operational barrel;

a second focusing operational barrel for moving all of the

lens groups for performing macro photographing operations;

a support barrel for supporting said lens groups, said support barrel being movable along the optical axis but not rotatable around the optical axis; and

a change-over rod slidably mounted on said support barrel, said change-over rod being axially movable between a first position and a second position, said change-over rod being selectively engageable and disengageable from said normal operational barrel and said second focusing operational barrel at a predetermined focusing position for normal photographing, said change-over rod being engaged with said normal operational barrel through said cooperating means at said first position, and said change-over rod being engaged with said second operational barrel at said second position, wherein at the first position, rotation of said normal operational barrel is prevented, each of said lens groups being integrally movable for macro photographing with one another with a spacing between said lens groups being maintained constant.



4,333,713

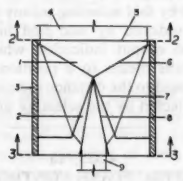
CONICAL BEAM CONCENTRATOR

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed May 6, 1981, Ser. No. 260,583

Int. Cl.³ G02B *13/18*

U.S. Cl. 350—432 **1 Claim**



1. A conical beam concentrator comprising an upper component lens mounted above a lower component lens inside a casing, with each component lens having one or two conical sections with surfaces which refract light rays at prescribed angles, with all conical sections being aligned on a common axis which is parallel to the light rays entering and exiting the component lenses, with all surfaces of the component lenses not used for the refraction and transmission of light rays being opaque;

(a) with the upper component lens having a planar section which receives parallel rays emanating from the sun, and a convex conical section which receives parallel rays transmitted from the planar section,

(b) with the lower component lens having a convex conical section which receives parallel rays refracted by the convex conical section of the upper component lens, and a concave conical section which receives parallel rays refracted by the convex conical section of the lower component lens and which refracts the rays out of the lower component lens in a direction parallel to the common axis of the conical sections.

4,333,714

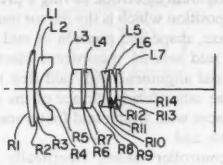
COMPACT WIDE ANGLE LENS

Melvyn H. Kreitzer, Cincinnati, Ohio, assignor to Vivitar Corporation, Santa Monica, Calif.

Continuation-in-part of Ser. No. 941,529, Sep. 11, 1978, abandoned. This application Feb. 4, 1980, Ser. No. 118,519

Int. Cl.³ G02B *13/04*

U.S. Cl. 350—460 **7 Claims**



1. A retrofocus lens comprising from the object end, a first group of negative power consisting of a positive element and a negative meniscus convex to the object, a second group having convex object and image side surfaces, and a third group comprising a biconcave element and two positive elements convex to the image end, and

$$1.2k_o > |k_1| > 0.9k_o$$

$$1.6k_o > k_2 > 1.2k_o$$

where

k_o is the optical power of the lens,

k_1 is the absolute optical power of the first group,

k_2 is the optical power of the second group, and the third group is of relatively weak optical power.

4,333,715

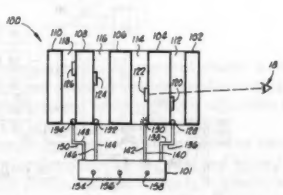
MOVING PICTURE APPARATUS

Philip A. Brooks, 436 NW. 46th Ter., Oklahoma City, Okla. 73118

Continuation-in-part of Ser. No. 941,146, Sep. 11, 1978, Pat. No. 4,294,516. This application Apr. 30, 1979, Ser. No. 34,293

Int. Cl.³ G03B *25/00*; G09F *13/00*; G02F *1/133*

U.S. Cl. 352—98 **2 Claims**



1. An apparatus for creating the effect upon a viewer of moving related images, as in a motion picture, comprising:

a display structure including a stacked array of a plurality of transparent members and gate members alternately positioned so that said stacked array has a first end thereof defined by a respective one of the transparent members and a second end thereof defined by another respective one of the transparent members and said stacked array also has a plurality of gate members disposed between consecutive transparent members, whereby there are a plurality of sets of facing surfaces of consecutively stacked transparent members, each set being disposed adjacent the two major surfaces of an associated gate member;

a plurality of pairs of image producers associated with said

display structure, each pair of said image producers comprising solely:

a first transparent electrode having a predetermined size, shape and position of the total pictorial image to be displayed, corresponding to a respective moment of the motion, said first transparent electrode being disposed on a respective one of the facing surfaces of a respective one set of these sets of facing surfaces;

a second transparent electrode having a predetermined size, shape and position which is the mirror image of the predetermined size, shape and position of said first transparent electrode, said second transparent electrode being disposed in axial alignment with said first transparent electrode on the other facing surface of the respective set of facing surfaces with which said first transparent electrode is associated; and

a scanning controller means, electrically connected to a plurality of pairs of image producers, for sequentially activating at a selectable rate each of said image producers so that each set of first and second transparent electrodes representing a respective total pictorial image to be displayed in motion become periodically visible to the viewer so the effect of motion is imparted thereto.

4,333,716

FOCUS DETECTION SYSTEM

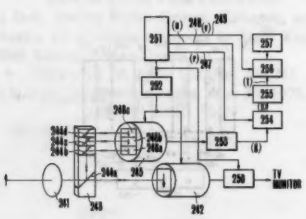
Toshio Sakane, Yokohama; Kazuya Hosoe, Machida; Tokuichi Tsunekawa, Yokohama; Takao Kinoshita, Tokyo, and Takashi Kawabata, Kamakura, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1979, Ser. No. 98,514

Claims priority, application Japan, Dec. 4, 1978, 53-150379

Int. Cl.³ G03B *7/099*

U.S. Cl. 354—25 **39 Claims**



18. An optical arrangement for receiving image forming radiation coming from an image forming optical system, said arrangement comprising in combination:

(A) a beam dividing member for receiving said image forming radiation coming from said image forming optical system and for dividing the received radiation into a plurality of radiation components to form at least three images with differing path lengths to their respective imaging points from the image forming optical system; and

(B) a plurality of radiation sensitive portions, each respectively for receiving said radiation components divided by said beam dividing member, said portions being arranged at different positions on a common plane.

4,333,717

CAMERA HAVING FOCUS DETECTION DEVICE

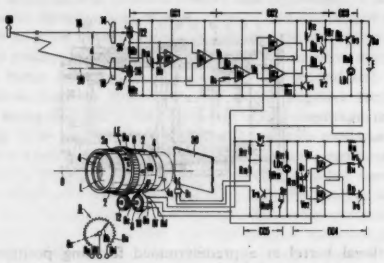
Shuichi Tamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 922,647, Jul. 7, 1978, Pat. No. 4,247,187. This application Dec. 31, 1980, Ser. No. 221,701

Claims priority, application Japan, Jul. 14, 1977, 52-84410; Aug. 5, 1977, 52-93998

Int. Cl.³ G03B *3/10*

U.S. Cl. 354—25 **6 Claims**



1. A device comprising:

(A) lens means adjustable along an optical axis for focusing on an object;

(B) distance detecting means for detecting the distance of the object and producing an electrical indication indicative of the object distance;

(C) first indicating means correlated with said lens means for producing an electrical indication indicative of the position of the lens means on the optical axis;

(D) second indicating means for providing an electrical indication indicative of at least one limited distance;

(E) selecting means for automatically selecting one of the electrical indications produced by said distance detecting means and the electrical indication provided by said second indicating means; and

(F) output indicating means response to the electrical indication selected by said selecting means and to the electrical indication produced by said first indicating means for producing an output indication which is available for setting the lens means to a position at which the lens means is focused to the distance indicated by the electrical indication selected by the selecting means.

4,333,718

PHOTOGRAPHIC FLASH CONTROL CIRCUITRY HAVING SELECTIVELY OPERABLE INTERNAL SENSOR

James R. Adams, Jr., Littleton, and Francis T. Ogawa, Lakewood, both of Colo., assignors to Rollei of America, Inc., Littleton, Colo.

Filed Jan. 16, 1980, Ser. No. 112,605

Int. Cl.³ G03B *15/05*

U.S. Cl. 354—31 **13 Claims**

1. Flash control circuitry for use with a photographic camera, comprising:

terminal means for receiving an electrical control signal;

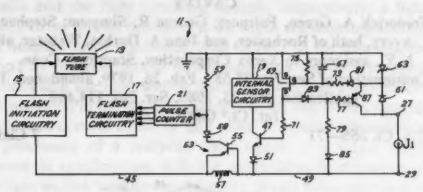
flash means for producing a photographic flash; and

circuit means interconnecting said terminal means and said flash means for initiating the flash of said flash means for producing light for illuminating an object to be photographed by the camera, and for automatically terminating the flash after a predetermined quantity of light has been received from the object, said circuit means including:

(i) means responsive to an electrical control signal received by said terminal means for firing said flash means;

(ii) light responsive integrating means arranged to receive

light from the object for effecting automatic termination of the flash of said flash means, said integrating means having a first state in which said integrating means is enabled for controlling flash termination and a second state in which said integrating means is disabled from controlling flash termination;

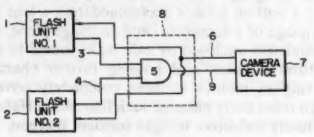


(iii) control means responsive to an electrical control signal received by said terminal means, for placing said integrating means in one of said first and second states; said second-named control signal and said third-named control signal being different voltage signals.

4,333,719
MULTIPLE FLASH ADAPTOR

Satoshi Takami, Niiza; Teruo Hagiwara, Ageo; Toru Kando, Tokyo, and Yoshifumi Kuroki, Tsurugashima, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1981, Ser. No. 240,422
Claims priority, application Japan, Mar. 10, 1980, 55/30825[U]
Int. Cl.³ G03B *15/05*
U.S. Cl. 354—132 **1 Claim**



1. A multiple flash adaptor for causing a plurality of flash units to simultaneously emit light in response to actuation by a single camera device, said camera device detecting electrical signals produced by said plurality of flash units when said plurality of flash units become ready for operation, comprising: a logical product circuit having inputs coupled to receive output signals from each flash unit indicative of the operatability of the flash unit and an output coupled to a single input of said camera device.

4,333,720
STOP CONTROL DEVICE

Ryoichi Suzuki, Kawasaki, and Takashi Uchiyama, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1980, Ser. No. 158,463
Claims priority, application Japan, Jun. 14, 1979, 54-74799
Int. Cl.³ G03B *9/56*
U.S. Cl. 354—227 **5 Claims**

1. A camera stop device having a controllable stop aperture so that a quantity of light corresponding to an effective T number can be selected to pass through the device, comprising:

(a) stop means including a physical property member responsive to a control signal to provide a variable light transmission factor, said member being arranged to form a light transmitting part of a first area and a light shielding part of a second area according to the values of said light transmission factor for said light transmitting part and said light shielding part; and

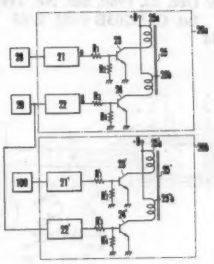
(b) a control circuit coupled to said physical property member for providing said control signal to select said first and said second areas according to a number of stopping steps

wherein the stop aperture corresponding to each stopping step is determined by the selected first area of said light transmitting part, said selected first area being determined in such a manner that the effective T number for each stopping step does not deviate from the equal multiplicative sequence.

4,333,721
ELECTROMAGNETICALLY DRIVEN SHUTTER

Syozo Yoshida, Machida, and Yoji Sugiura, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1980, Ser. No. 163,405
Claims priority, application Japan, Jul. 3, 1979, 54-84179
Int. Cl.³ G03B *9/08*
U.S. Cl. 354—234 **6 Claims**



1. In an electromagnetically operated shutter having a first shutter member and a second shutter member with a slit opening formed therebetween being rendered adjustable to control an exposure, the improvement comprising:

(a) a first electromagnet for driving said first shutter member, said electromagnet having first and second magnetic coils which produce magnetic fluxes in directions opposite to each other, whereby the current supply to said first magnetic coil causes forward movement of said first shutter member, and the current supply to said second magnetic coil causes backward movement of said first shutter member;

(b) a first switching element connected to said first magnetic coil, said switching element when actuated causing current to flow through said first magnetic coil;

(c) a second switching element connected to said second magnetic coil, said element when actuated causing current to flow through said second magnetic coil;

(d) a second electromagnet for driving said second shutter member to move, said electromagnet having third and fourth magnetic coils which produce magnetic fluxes in directions opposite to each other, whereby the current supply to said third magnetic coil causes forward movement of said second shutter member and the current sup-

ply to said fourth magnetic coil causes backward movement of said second shutter member;

(e) a third switching element connected to said third magnetic coil, said element when actuated allowing current to flow through said third magnetic coil;

(f) a fourth switching element connected to said fourth magnetic coil, said element when actuated allowing current to flow through said fourth magnetic coil;

(g) release actuating signal forming means;

(h) counting means for producing a shutter closing signal in a time necessary to take an exposure from the start of an exposure actuation;

(i) a first circuit alternatively receptive of a release actuating signal and a shutter closing signal, said circuit responsive to said release actuating signal for producing a signal which causes said first switching element to be actuated, and responsive to said shutter closing signal for producing a signal which causes said second switching element to be actuated; and

(j) a second circuit receptive of said shutter closing signal and said release actuating signal in the reverse order to that in which they enter said first circuit, said circuit responsive to said shutter closing signal for producing a signal which causes said third element to be actuated, and responsive to said release actuating signal for producing a signal which causes said fourth element to be actuated.

4,333,722

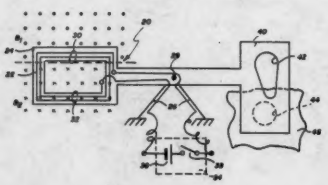
METHOD OF CONTROLLING ELECTROMAGNETIC ACTUATOR IN A CAMERA, AND ACTUATOR CONTROLLABLE THEREBY

James K. Lee, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 22, 1980, Ser. No. 219,168

Int. Cl.³ G03B *9/02, 9/62*

U.S. Cl. 354—234 **9 Claims**



1. In a camera, of the type having an electromagnetic actuator, including an armature having an electrical conductor movable in a magnetic field in response to an electrical current being applied to the conductor, and means for urging the armature toward a relative rest position; the improvement comprising control circuit means for supplying a series of current pulses to said conductor, the frequency of said pulses being above the cutoff frequency of said actuator, such that the duration of said pulses in said series determines the extent of movement of said armature, and the number of pulses in said series determines the duration of the movement.

3. In a camera of the type having an electromagnetic actuator including an armature having a conductor, means for producing a magnetic field in the vicinity of the conductor, means for mounting the armature for displacement relative to the magnetic field producing means in response to an electrical current being applied to the conductor, conductor means for applying an electrical current to the armature conductor and spring means connected between the armature and the magnetic field producing means for urging the armature toward a rest position, the improvement wherein:

said mounting means, said conductor means, and said spring means comprise a conductive flexure hinge having first and second conductive flexible elements, said armature conductor being electrically connected between said flexible elements.

4,333,723

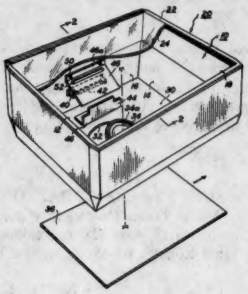
FULL FRAME FLASH ILLUMINATION SYSTEM UTILIZING A DIFFUSE INTEGRATING OPTICAL CAVITY

Frederick A. Green, Fairport; George R. Simpson; Stephen T. Avery, both of Rochester, and John A. Durbin, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 15,557, Feb. 26, 1979, abandoned. This application Jan. 23, 1980, Ser. No. 114,480

Int. Cl.³ G03B *27/72*

U.S. Cl. 355—71 **7 Claims**



1. A full frame, flash illumination system for a document copying machine comprising:

a housing having a top surface defining an object plane and containing a platen for supporting a document to be copied, a bottom surface accommodating a lens for focusing an image of a document onto an image plane, said housing completely enclosed by side walls joined to said top and bottom surfaces, said housing further characterized by having its interior surfaces completely covered with a high reflectivity material such that said surfaces are highly diffusely reflective to light incident thereon,

a single flash illumination source positioned within said housing between said top and bottom surfaces,

a blocking element positioned between the source and the platen of sufficient length and width to prevent direct illumination from the source from reaching any portion of the platen, said element including an aperture therein, and

means to intermittently pulse said illumination source to produce light flashes of pre-defined direction and intensity a portion of said light passing through said aperture, said flashes undergoing multiple reflections from said coated surfaces to achieve a uniformly diffuse irradiation at the platen.

4,333,724

PHOTOELECTRIC DETECTOR

Hiroshi Honma, Hino, Japan, assignor to Hochiki Corporation, Tokyo, Japan

Filed Jun. 26, 1980, Ser. No. 163,073

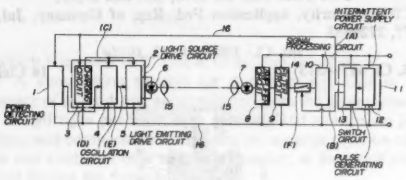
Claims priority, application Japan, Jun. 27, 1979, 54-80095; Jul. 3, 1979, 54-83446

Int. Cl.³ G01N *21/00*

U.S. Cl. 356—437 **3 Claims**

1. In a photoelectric detector wherein a light transmitting section including a light source and a light receiving section for receiving and processing a light signal from the light transmitting section are disposed remote from each other and connected through a power line to detect a change in a transmitted light amount due to cut-off or attenuation of light beams therebetween, the improvement comprising: an intermittent power

supply circuit for intermittently supplying power to the light transmitting section and outputting a pulse corresponding to intermittently supplied power; a power detecting circuit for detecting the intermittent power to output a control signal depending upon the detected conditions; said intermittent power supply circuit and said power supply detecting circuit being provided in one and the other of the light transmitting section and the light receiving section, respectively; a light source drive circuit provided in the light transmitting section and adapted to be controlled with respect to the illumination period by the intermittent power supply or the control signal to illuminate the light source intermittently; and a switch circuit provided in the light receiving section and driven according to said control signal or said pulse to control transmission or processing of a received light signal or a signal based thereon in synchronism with the intermittent illumination of the light source; said power detecting circuit being provided in said light transmitting section; said intermittent power supply



circuit is provided in the light receiving section; said light source drive circuit includes a charging circuit adapted to be charged during the power supply period and to illuminate said light source in response to the control signal from said power detecting circuit, using the charged electric charge at said charging circuit when no power is supplied; said intermittent power supply includes a pulse generating circuit for intermittently producing pulses to intermittently supply the power and to drive said switch circuit; and said switch circuit is driven by said pulses to operate for allowing transmission or processing of the received light signal or the signal based thereon when no power is supplied; a short circuit connected between the power source output terminals at the light receiving section which communicate with the power lines to the light transmitting section; said short circuit being adapted to made the impedance between the power lines low to discharge electric charge of mutual capacitance between the lines only during those periods when said intermittent power supply circuit does not power the light transmitting section.

4,333,725

COMPRESSION STRESSED WELD JOINTS ON OFFSHORE PLATFORMS

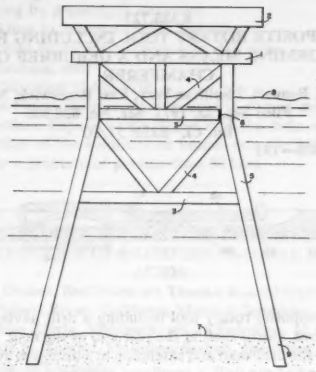
Marvin L. Peterson, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Continuation of Ser. No. 790,504, Apr. 25, 1977, abandoned. This application Jun. 2, 1978, Ser. No. 912,164

Int. Cl.³ F16B *11/00*

U.S. Cl. 403—271 **9 Claims**

1. In a weld joint joining in fluid-tight relationship the end of a first elongated hollow tubular structural member to the side of a second elongated tubular structural member wherein at least a portion of the weld joint is subject to cyclic tension and stress, the improvement comprising: means for applying a compressive load to the weld joint subsequent to solidification of the weld joint sufficient to place the weld joint in compressive stress, the means for applying compressive load being internal in the hollow tubular members, the external environment being a corroding marine environment, and the interior of the hollow tubular structural members being additionally protected from the external environment by filling with con-



crete, an inert gas, or organic polymer, a potting material, an oily material, a paraffinic material, or bitumen.

4,333,726

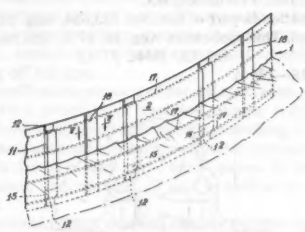
WATER BARRIER FLOTATION CURTAIN

Kaj O. H. Fuxelius, Billingsfors, Sweden, assignor to Billingsfors Bruks Aktiebolag, Billingsfors, Sweden

Continuation of Ser. No. 641,504, Dec. 17, 1975, abandoned. This application May 11, 1977, Ser. No. 795,806

Int. Cl.³ E02B *15/04*

U.S. Cl. 405—72 **8 Claims**



1. A water barrier flotation curtain comprising an elongated barrier provided with floating means and sinking means balanced to maintain the curtain in an essentially vertical floating position with its upper elongated edge area positioned above water level, characterized in that the barrier is made of a longitudinally flexible, water-resistant, elongated paper web having at spaced intervals, parallel, vertical, rectangular ribs alternating with rectangular panels, said panels having a uniform thickness transversely and longitudinally and said ribs being narrow relative to said panels and said curtain being capable of being rolled upon itself into an easily handleable package; in that said web is made of two continuous paper sheets, which are laminated together with a laminating material and which at intervals, as seen in the longitudinal direction of the barrier, are separated to provide said ribs, at least some of which comprise vertical pockets which house said sinking means in the bottom portion thereof and said floating means in the top portion thereof with the sinking means and floating means being so balanced in said pockets that, without any other sinking and floating means, said barrier is maintained in the desired essentially vertical floating position with its upper elongated edge area positioned above the water level; in that said panels have a thickness determined solely by the thickness of said sheets and said laminating material; and in that some of

the ribs comprise portions of said web folded back on itself into reinforcing ribs.

4,333,727

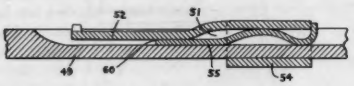
COMPOSITE ROTARY TOOL INCLUDING HOLE FORMING MEANS AND A DEBURRER OR CHAMFERER

Donald C. Bennett, 2 Sullivan Way, East Brunswick, N.J. 08816

Filed Sep. 23, 1977, Ser. No. 835,905

Int. Cl.³ B23B *51/00*

U.S. Cl. 408—191 **2 Claims**



1. A composite rotary tool including a drill having a front and rear end, a drill shaft at the rear end of the drill, a groove formed in the drill shaft and extending in a direction away from the rear end of the drill, a cantilever support mounted at least partially in the groove, a cutter carried by the cantilever support and extending in the direction of the drill for removing a small amount of material from an edge of a hole following the drilling operation, the cantilever support including a split ring and a cantilevered spring member supporting the cutter and means for adjusting tension of the spring member.

4,333,728

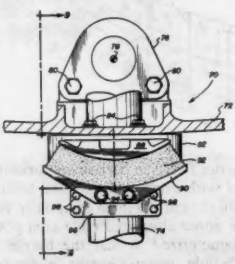
COMPOUND HUB SPRING SYSTEM FOR HELICOPTERS

Jan M. Drees, Dallas County; Larry W. Dooley, and William D. Neathery, both of Tarrant County, all of Tex., assignors to Textron, Inc., Providence, R.I.

Continuation-in-part of Ser. No. 823,624, Aug. 11, 1977, abandoned. This application Aug. 29, 1979, Ser. No. 70,877

Int. Cl.³ B64C *27/52*

U.S. Cl. 416—134 A **14 Claims**



1. A rotor blade mounting for a flapping main rotor of a helicopter with a rotatable drive mast, comprising:

a trunnion attached to the mast, said trunnion including structure extending from opposite sides thereof to define a teetering axis;

a yoke mounted on said trunnion for pivotal movement about said teetering axis, said yoke having rotor blades attached thereto;

first elastomeric spring means connected between said yoke and mast for continuously opposing flapping of the rotor blades with a restraining shear bias of predetermined first spring rate, said first spring means being disposed in spaced relationship with the teetering axis; and

second elastomeric spring means mounted on said yoke to engage said mast for opposing flapping of the rotor blades beyond a preselected flapping angle with a restraining compression bias of relatively higher second spring rate so that overall the flap-opposing bias is nonlinear, said second spring means being positioned on opposite sides of the mast in spaced apart relationship with the teetering axis.

4,333,729

APPARATUS FOR HOMOGENIZING LIQUID AND VISCOUS SUBSTANCES

Max H. Marugg, Zizers, Switzerland

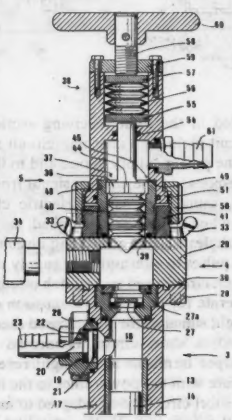
PCT No. PCT/EP78/00002, § 371 Date Feb. 28, 1979, § 102(e) Date Feb. 28, 1979, PCT Pub. No. WO79/00020, PCT Pub. Date Jan. 25, 1979

PCT Filed Jun. 26, 1978, Ser. No. 15,952

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1977, 2729855

Int. Cl.³ F04B *39/12, 39/14*

U.S. Cl. 417—313 **14 Claims**



1. Homogenizing apparatus for liquid and pulpy substances, consisting of a high-pressure pump with a crank drive and at least one piston arranged in a cylinder block, driven by means of connecting and side rods, and connected to a homogenizing device placed on a cylinder block, which device has a homogenizing head that consists of a sleeve with a smooth spherical bore up on the outlet side and a plunger held by axial compression arranged in this borehole, which plunger consists of a solid section of essentially truncated cone-shaped surface area, onto which axial and successive step rings are built, each of which steps are placed with their outer periphery toward the borehole, is characterized by the fact that an intermediate chamber, which may be opened, is placed between homogenizing unit and cylinder head of the high-pressure pump and further characterized in that the high-pressure pump/formed with horizontal cylinders is joined by means of a trough to the crankshaft drive and crankcase holding leak-proof guidebars, that trough holds guidebar with side rods joined to piston, and that ring-shaped collars are arranged on side rods.

4,333,730

META-PHENYLENEDIAMINES, DYEING COMPOSITIONS IN WHICH THEY ARE PRESENT AND THE CORRESPONDING DYEING PROCESS

Andree Bugaut, Boulogne; Majdi M. Shahin, Paris; Jean-Jacques H. Vandenbossche, Aulray-Sous-Bois, and Gregoire Kalopissis, Neuilly sur Seine, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

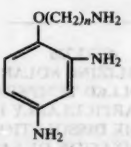
Filed Apr. 18, 1980, Ser. No. 142,572

Claims priority, application France, Apr. 26, 1979, 79 10683

Int. Cl.[3] A61K *7/13*

U.S. Cl. 8—407 32 Claims

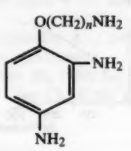
1. A compound of the formula:



(I)

in which n is equal to 2, 3 or 4, or an acid salt thereof.

4. A composition suitable for dyeing human hair in the presence of an oxidizing agent selected from the group consisting of hydrogen peroxide, urea peroxide and ammonium persulfate, said composition comprising an aqueous solution of at least one oxidation base and, as a coupler, at least one compound having the formula



(I)

in which n is equal to 2, 3 or 4, or an acid salt thereof.

4,333,731

METHOD AND APPARATUS FOR THE MANUFACTURE OF TANNED HIDES AND SKINS

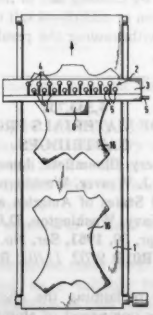
Peter Schindlmayr, Rheinbach, and Horst Zäpfel, Karlsruhe, both of Fed. Rep. of Germany, assignors to Arenco-BMD Maschinenfabrik GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Jul. 12, 1979, Ser. No. 56,849

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1978, 2831617

Int. Cl.[3] C14C *15/00, 1/04, 1/06, 3/30*

U.S. Cl. 8—436 12 Claims



1. Method for the manufacture of tanned hides and skins with the following steps of procedure:

(a) Soaking of the hide,
(b) Liming in alkaline medium,
(c) Deliming in acid medium,
(d) Bating by proteolytic enzymes,
(e) Pickling by means of acids and salts,
(f) Tanning by means of chromium -III- salts,
(g) Retanning, and
(h) Fatliquoring of the hide,

wherein the solutions or liquids used in one or more of the procedure steps are introduced into the hide or skin by injection of the solutions or liquids into the hide or skin under a pressure of greater than 50 bars.

4,333,732

DYESTUFF PREPARATIONS CONTAINING OXALKYLATES OF MODIFIED NATURAL ROSIN ACIDS

Reinhold Deubel, Bad Soden am Taunus; Konrad Opitz, Liederbach; Hubert Kruse, Kelkheim; Manfred Schneider, Eppstein, and Heinz Uhrig, Steinbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 13, 1979, Ser. No. 75,032

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1979, 2924404

Int. Cl.[3] C09B *67/00;* D06P *1/16*

U.S. Cl. 8—527 15 Claims

1. A dyestuff preparation, comprising a water-insoluble dyestuff and water-soluble oxalkylate of the formula

$$A\text{-}[(X\text{-}O)_n\text{-}H]_m,$$

wherein

A is selected from the group consisting of radicals of

(a) modified natural rosin acids, each of which is obtained by disproportionation, dimerization, hydrogenation or dehydrogenation of a natural rosin acid or by reaction of colophony with an aromatic hydroxy compound, or aryl, aralkyl or cycloalkyl compound capable of splitting off halogen,

(b) esterification products of natural rosin acids, and esterification products of modified natural resin acids as defined in (a), each obtained by esterifying 1 to 4 mols of such natural rosin acid or modified natural rosin acid with 1 mol of a di-, tri-, tetra-, penta- or hexahydric alcohol, and mixtures of said esterification products, and

(c) maleinate rosins obtained from colophony by reaction with maleic anhydride and subsequent esterification of the anhydride group;

X stands for a group or groups, either identical or different, of the formulae $-CH_2-CH_2-$ and $-CH_2-CH(CH_3)-$;

n stands for a number of from 8 to 100; and

m stands for a number of from 1 to 5.--;

4,333,733

CONTINUOUS RELEASE OF REAGENT IN AN ANALYTICAL ELEMENT TO REDUCE ASSAY INTERFERENCE

Karl J. Sanford, and Jon N. Elkenberry, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 17, 1980, Ser. No. 169,704

Int. Cl.[3] G01N *21/78, 31/22, 33/68*

U.S. Cl. 23—230 B 27 Claims

25. A method for the selective determination of an analyte in an aqueous fluid containing said analyte, said method comprising

(a) contacting a sample of said fluid with a reaction zone of a multizone dry analytical element having a reaction zone in fluid contact with a dry reagent zone; said reagent zone being impermeable to said analyte and interferents to an assay for said analyte and includes a reagent composition

comprising a chromogenic indicator which interacts with said analyte and interferents to produce a color response; and said contacting causes release of said reagent composition from said reagent zone to said reaction zone at a rate sufficient to produce an analyte color response corresponding to

(1) the interaction of said indicator with said analyte, and

(2) reduced interaction of said indicator with interferents; and

(b) determining said analyte from said analyte color response.

4,333,734

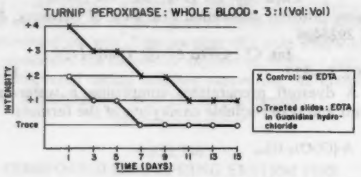
DIAGNOSTIC DEVICE FOR FECAL OCCULT BLOOD AND METHOD OF USE

Martin Fleisher, Glen Cove, N.Y., assignor to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Continuation-in-part of Ser. No. 113,414, Jan. 18, 1980, abandoned. This application Oct. 8, 1980, Ser. No. 195,220

Int. Cl.³ G01N *21/78, 33/72*

U.S. Cl. 23—230 B 12 Claims



1. In a process for determining the presence of fecal occult blood in a test sample using a test matrix containing guaiac, the improvement for preventing false-positive results in the presence of peroxidase enzymes comprising the steps of

at least partially denaturing the protein forming the peroxidase enzymes with an effective amount of a compound from the group consisting of soluble salts of guanidine, urea and salicyclic acid to attenuate enzymatic activity; and

effectively removing from reaction with the peroxidase enzymes, magnesium and/or calcium ions, necessary for efficient biochemical activity of the peroxidase enzyme.

4,333,735

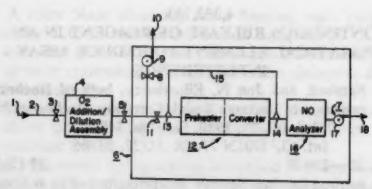
PROCESS AND APPARATUS FOR MEASURING GASEOUS FIXED NITROGEN SPECIES

James E. Hardy, Scotch Plains, and John J. Knarr, South Plainfield, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 16, 1981, Ser. No. 244,205

Int. Cl.³ G01N *21/75, 31/12*

U.S. Cl. 23—232 R 20 Claims



1. An improved process for measuring the total concentration of fixed nitrogen species, including NO, NO_2, NH_3 and HCN, in a gaseous mixture involving the steps of contacting said gaseous mixture with a conversion catalyst at elevated temperature and in the presence of excess elemental oxygen and thereby converting said fixed nitrogen species to NO and measuring the resulting NO concentration and calculating therefrom said total concentration of gaseous fixed nitrogen species, in which the improvement comprises the combined steps of:

(a) reducing the pressure of said gaseous mixture to about 0.03 MPa or below;

(b) preheating said gaseous mixture from step (a) to a temperature in the range of about 700°–1100° K in a non-catalytic preheat zone; and

(c) contacting said preheated gaseous mixture from step (b) with said conversion catalyst at a temperature in the range of about 800°–1100° K. for a sufficient time to convert substantially all of said gaseous fixed nitrogen species to NO.

4,333,736

METHOD OF UTILIZING SOLAR PONDS FOR EFFECTING CONTROLLED TEMPERATURE CHANGES OF SOLUTIONS PARTICULARLY IN PROCESSES INVOLVING THE DISSOLUTION AND/OR PRECIPITATION OF SALTS

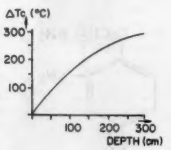
Sraya Shachar, Ramat Gan, Israel, assignor to Solmat Systems Ltd., Jerusalem, Israel

Filed Jan. 21, 1980, Ser. No. 113,782

Claims priority, application Israel, Jan. 26, 1979, 56510

Int. Cl.³ B01D *9/02*

U.S. Cl. 23—295 S 29 Claims



1. A method of changing the salt content of a solution, comprising: establishing a non-convective solar pond including the salt, which pond is heated by solar radiation and has a stable salt-concentration gradient and a stable temperature gradient increasing from the top of the pond to the bottom thereof, the bottom layer of the pond being a substantially saturated solution at a predetermined temperature; introducing a feed solution containing the salt directly into the bottom layer and circulating same through the bottom layer; said predetermined temperature of the bottom layer being different from the initial temperature of the feed solution when introduced into the pond bottom layer and being selected to effect a change in solubility, and thereby a change in the salt content, of the feed solution by causing salt in the feed solution to be precipitated therefrom or additional salt to be dissolved in the feed solution; and withdrawing the resulting depleted or enriched feed solution.

4,333,737

RECLAMATION OF MATERIALS FROM PHOTOFLASH CARTRIDGES

Francis E. Montgomery, Bloomfield; James E. Short, Jr., Switz City, and William J. Weaver, Washington, all of Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 30, 1981, Ser. No. 258,984

Int. Cl.³ B01D *9/02, 11/02;* B01F *1/00*

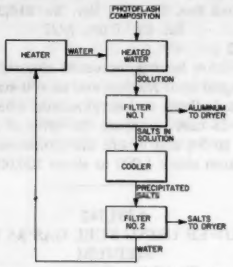
U.S. Cl. 23—297 3 Claims

1. A process for reclaiming the chemical ingredients in photoflash cartridges comprised of aluminum powder, potassium perchlorate and barium nitrate, said process comprising, first dissolving said potassium perchlorate and said barium nitrate in water heated to about 130 degrees F.,

then filtering said aluminum powder from the heated water solution,

then cooling said water solution to about 75 degrees F. to precipitate said potassium perchlorate and said barium nitrate, and

then filtering said potassium perchlorate and said barium nitrate from the water.

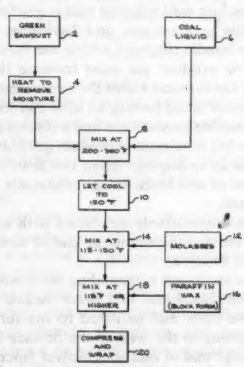


4,333,738

SYNTHETIC FIRE LOG AND METHOD FOR MAKING SAME

Jimmy Schrader, Louisville, Ky., assignor to John S. Mathis, Shelbyville, Ky., a part interest

Filed Nov. 24, 1980, Ser. No. 209,717
Int. Cl.[3] C10L *5/10*
U.S. Cl. 44—15 B 10 Claims



1. A method for making synthetic fire logs, the steps of which comprise

providing a quantity of relatively dry sawdust,

mixing said quantity of relatively dry sawdust with of coal liquid, molasses and wax at an elevated temperature at least sufficient to melt said wax and form a thoroughly incorporated mixture,

compressing said mixture in a mold to form a compacted mass, and

removing said compacted mass from said mold after said mass has cooled to a suitable handling temperature wherein the proportion of coal liquid mixed in said mixture is in a range of about 6–32 percent by weight of the total weight of said green sawdust, coal liquid, molasses and wax used to form said mixture.

4,333,739

BLENDED ETHANOL FUEL

Alan M. Neves, 1596 24th St., Ogden, Utah 84401

Filed Oct. 23, 1979, Ser. No. 87,618
Int. Cl.[3] C10L *1/02*
U.S. Cl. 44—52 11 Claims

1. A fuel comprising:

an ethanol base having a composition by volume percent of about 70% to about 85% ethanol and about 30% to about 15% water;

a volatile hydrocarbon component in an amount of about 4% to about 10% by volume of the ethanol base, said hydrocarbon component being selected from the group consisting of lower alkanes, alkenes, alkynes, dienes, or cyclo-forms thereof, having from 1 to 6 carbon atoms; and

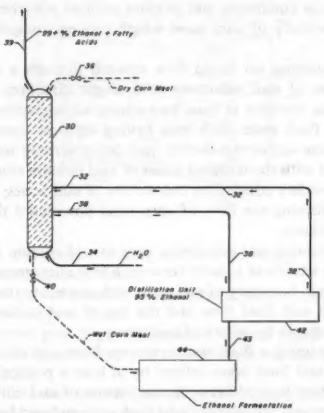
benzene in an amount sufficient to prevent separation of the water from the other components of the fuel.

4,333,740

PROCESS FOR THE SEPARATION OF WATER FROM ETHANOL

James W. Priegnitz, Elgin, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 23, 1980, Ser. No. 219,746
Int. Cl.[3] C10L *1/02*; C07C *29/76*
U.S. Cl. 44—56 17 Claims



1. A process for separating water from a feed mixture comprising ethanol and water which process comprises contacting at adsorption conditions said mixture with an adsorbent consisting essentially of corn meal which process comprises the steps of:

(a) maintaining a plurality of chambers containing said adsorbent serially connected by connecting conduits, said chambers comprising three sections, an adsorption section, a flush section and a reload section, each section comprising one or more whole chambers and having separate operational functions occurring therein:

(b) maintaining net liquid flow in a single direction through said adsorption section and said flush section;

(c) maintaining said adsorption section defined by chambers located between a feed inlet stream at the upstream boundary of said section and a raffinate outlet stream at the downstream boundary of said section;

(d) maintaining said flush section upstream from said adsorption section, said flush section having the operational function of displacing ethanol from the chambers in the flush section with water, said flush section defined by at least a portion of the chambers located between a water inlet stream at an upstream boundary of said flush section and said feed inlet stream;

(e) passing said feed mixture into said adsorption section at adsorption conditions to effect the selective adsorption of water by said corn meal and withdrawing a raffinate outlet stream from said adsorption zone, the ethanol concentration in said outlet stream being greater than the ethanol concentration in said feed mixture;

(f) periodically advancing through said chambers in a downstream direction with respect to said net fluid flow all streams, including the feed inlet stream, raffinate outlet stream, and water inlet stream to effect the shifting of sections through said chambers, the operational function of the chambers comprising said reload section prior to said advancement changing to the furthermost downstream chambers of said adsorption section subsequent to said advancement, and the operational function of a like number of chambers comprising the furthermost upstream chambers of said flush section prior to said advancement changing to the reload section subsequent to said advancement; and

(g) replacing the wet corn meal with dry corn meal in the chambers comprising the reload section during the time between each periodic advancement.

2. The process of claim 1 wherein said feed mixture comprises about 95 wt. % ethanol and about 5 wt. % water.

8. A process for separating water from a feed mixture comprising ethanol and water which process comprises contacting at adsorption conditions said mixture with an adsorbent consisting essentially of corn meal which process comprises the steps of:

(a) maintaining net liquid flow upward through a vertical column of said adsorbent in a single direction, which column contains at least two zones, an adsorption zone and a flush zone, each zone having separate operational functions occurring therein and being serially interconnected with the terminal zones of said column connected to provide a continuous connection of said zones;

(b) maintaining net flow of corn meal downward through said column;

(c) maintaining said adsorption zone in said column defined by the adsorbent located between a feed inlet stream at an upstream boundary of said zone with respect to the direction of said fluid flow and the top of said column at a downstream boundary of said zone;

(d) maintaining a flush zone upstream from said adsorption zone, said flush zone defined by at least a portion of the adsorbent located between the bottom of said column at an upstream boundary of said flush zone and said feed inlet stream;

(e) passing said feed stream into said adsorption zone at adsorption conditions to effect the selective adsorption of water by said adsorbent in said adsorption zone and withdrawing a raffinate outlet stream from said adsorption zone, the ethanol concentration in said outlet stream being greater than the ethanol concentration in said feed mixture;

(f) passing said water inlet stream into said flush zone to effect the displacement of said ethanol from the adsorbent in said flush zone; and

(g) continuously introducing dry corn meal into the top of said column and withdrawing wet corn meal from the bottom of said column.

9. The process of claim 8 wherein said feed mixture comprises about 95 wt. % ethanol and about 5 wt. % water.

15. The process of either of claims 2 or 9 wherein fatty acids contained in said raffinate outlet stream are removed by mixing said stream with hydrocarbon liquid to obtain a product mixture, thereby effecting the formation of a precipitate containing said fatty acids, which precipitate is then filtered from said product mixture to obtain a product mixture of reduced fatty acid content.

4,333,741

OLEFIN-ACRYLONITRILE COPOLYMERS AND USES THEREOF

Michael I. Naiman, and Rudolf S. Buriks, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Jun. 27, 1977, Ser. No. 810,342
Int. Cl.[3] C10L 1/22
U.S. Cl. 44—62 14 Claims

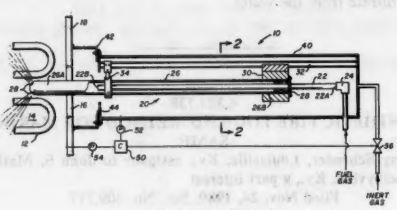
1. A composition having increased electrical conductivity comprising a liquid hydrocarbon and an anti-static amount of a copolymer of a 1-alkene and acrylonitrile where the 1-alkene has from 6 to 28 carbon atoms, the ratio of acrylonitrile to 1-alkene is 1:1 to 5:1 and where the molecular weight of the copolymer is from about 1,000 to about 100,000.

4,333,742

SOOT BLOWER USING FUEL GAS AS BLOWING MEDIUM

Michael C. Tanca, Tariffville, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 4, 1981, Ser. No. 240,427
Int. Cl.[3] C10J 3/86
U.S. Cl. 48—77 2 Claims



1. In combination with a coal gasifier having a furnace defined by a bounding wall wherein coal is gasified to generate a hot combustible product gas, and having at least one heat exchange tube bundle disposed within the furnace so that the hot combustible product gas must traverse the tube bundle before leaving the furnace, a soot blower assembly comprising:

a. a soot blower lance having an inlet end for receiving the hot combustible product gas and a discharge end through which the hot combustible product gas is directed into the furnace so as to impinge upon the tube bundle, the discharge end of said lance being translatable into and out of said furance;

b. drive means operatively associated with said soot blower lance for moving the discharge end of said lance into and out of said furnace;

c. a gas tight enclosure surrounding the combination of said soot blower lance and said drive means, said enclosure having one open end mounted to the furnace about an access opening in the wall of the furnace through which the discharge end of said soot blower lance passes to gain access to the heat exchange tube bundle disposed within the furnace; and

d. supply means for injecting inert gas into said gas tight enclosure so as to maintain the gas pressure within said gas tight enclosure higher than the gas pressure within the furnace.

4,333,743

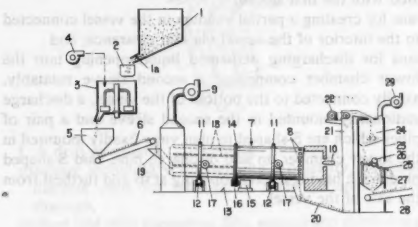
SAND-BLASTING ABRASIVE MATERIALS AND METHOD OF PRODUCING THE SAME

Nobuo Nojima, Hyogo, Japan, assignor to Nojimagumi Co., Ltd., Hyogo, Japan

Filed Oct. 25, 1977, Ser. No. 845,139
Int. Cl.[2] C09G 1/16; B24B 37/00
U.S. Cl. 51—298 3 Claims

1. A method of producing pulverized abrasive materials for

sand blasting, comprising the steps of: carrying out a first phase by adding two parts of a thermosetting resin, to which one part of a setting catalyst has been added, to 100 parts of a pulverized material of grade No. 4, selected from the group that consists of silica sand and slag; uniformly mixing them while blowing heated air thereinto at about 80° to 100° C., constituting a first heat treatment, so as to coat the resulting pulverized sand-blasting abrasive material with the resin in a fixed thickness, to dry and to thermally set the resin coating on the abrasive material; and carrying out a second, separate phase by a subsequent re-heating treatment at about 300° C. while stirring up, so as to change chemically the resin coating, obtained on the



abrasive material in the first heat treatment, and to render the coating unsoluble and unmeltable while leaving the abrasive material in the pulverized condition; the coating increasing the strength of the abrasive material by penetrating into cracks inherent in the abrasive material so that a substantial proportion of the pulverized abrasive material can be recovered after the sand blasting for re-use; whereby the heat, generated by impact when the abrasive material is blown against a surface, to be cleaned by the sand blasting, leaves the unsoluble and unmeltable coating in this state, and actually continues the setting of that coating so that sand-blasting efficiency is increased; and whereby dust formation during the sand blasting is reduced, thereby increasing environmental protection.

4,333,744

TWO-FEED PRESSURE SWING ADSORPTION PROCESS

Andrija Fuderer, Antwerp, Belgium, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 9, 1981, Ser. No. 241,638
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—25 **20 Claims**

1. An improved pressure swing adsorption process for the separation and purification of hydrogen contained in a gas stream having a relatively high concentration of carbon dioxide therein comprising:

(a) pretreating at least about 30% up to about 80% by volume of said gas stream to remove a substantial portion of said carbon dioxide therefrom, the unpretreated gas stream having a carbon dioxide content of at least about twice that of the thus-pretreated gas stream;

(b) passing the pretreated gas stream at an elevated adsorption pressure to the feed end of an adsorbent bed capable of adsorbing carbon dioxide and other impurities of said stream, a purified hydrogen stream being withdrawn from the product end of the bed having an advancing adsorption front therein;

(c) upon completion of step (b), passing the unpretreated gas stream to said feed end of the bed at essentially the same pressure as in step (b), a second adsorption front being created at the higher concentration and adsorption loading of carbon dioxide, a purified hydrogen stream continuing to be withdrawn from the product end of the bed;

(d) concurrently depressurizing said bed to release void space gas from the product end of the bed;

(e) countercurrently depressurizing said bed to a lower desorption pressure to desorb and release carbon dioxide and other impurities from the feed end of the bed;

(f) repressurizing said bed to said elevated adsorption pressure; and

(g) repeating said steps (b)–(f) for the separation and purification of additional quantities of hydrogen;

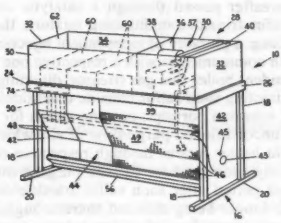
whereby the recovery of purified hydrogen is enhanced at a significant savings in equipment and operating costs as compared with the pretreatment of all of the gas stream for removal of carbon dioxide therefrom.

4,333,745

WORKBENCH FILTERING STATION AND METHOD

Ernest J. Zeanwick, Muskegon, Mich., assignor to Textron, Inc., Providence, R.I.

Filed Nov. 28, 1980, Ser. No. 211,257
Int. Cl.³ B01D *46/02*; F24F *3/16*
U.S. Cl. 55—97 **16 Claims**



1. A workbench filtering station comprising:

an open support frame;

a first pair of parallel, spaced vertical panels suspended from said support frame;

a second pair of parallel, spaced vertical panels secured to said support frame and perpendicular to said first pair of panels;

said first and second pair of vertical panels enclosing said open support frame to thereby define a generally open interior;

gas flow inlet means provided on at least one of said panels for communicating with said open interior, said gas flow inlet means including a perforated area having a selected ratio of open area to solid area disposed on a portion of said at least one panel of said first pair of panels, said perforated area regulating the volume of air drawn into the generally open interior;

first filter means having a first filtering efficiency arranged in said generally open interior and in communication with said gas flow inlet means for cleaning the gas flow to a first selected particulate level;

second filter means having a filtering efficiency greater than said first filter means, said second filter means being supported on said frame and disposed in a chamber in fluid communication with said generally open interior so as to clean the gas flow to a second selected particulate level;

fan means mounted on said frame for providing a constant volume gas flow through said generally open interior wherein said fan means maintains a selected static pressure at the outlet thereof; and

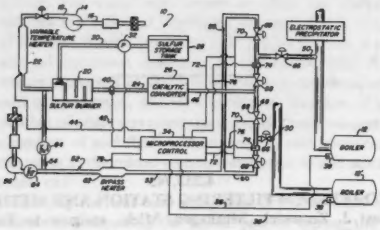
exhaust means in communication with said chamber in which said second filter means is disposed for discharging a clean gas flow.

4,333,746

GAS CONDITIONING MEANS FOR A PLURALITY OF BOILERS

Barry Southam, San Juan Capistrano, Calif., assignor to Wahlco, Inc., Santa Ana, Calif.

Filed Apr. 24, 1981, Ser. No. 257,343
Int. Cl.[3] B03C *3/34*
U.S. Cl. 55—106 10 Claims



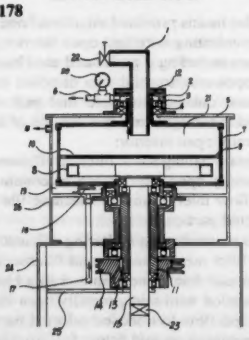
1. In a sulfur trioxide conditioning system which includes heater means for heating air and means for conditioning a first flow of air, which has been heated by a first section of said heater means, to produce a sulfur dioxide conditioning mixture which is thereafter passed through a catalytic converter to produce a sulfur trioxide conditioning mixture, the improvement comprising: a plurality of independent injection portions, each of which communicates with a respective one of a plurality of independent boiler flue gas streams; directing means for selectively directing such sulfur trioxide conditioning mixture through said injection portions; purging means for selectively directing an unconditioned purge flow of air, which has been heated by said heater means, through respective ones of said independent injection portions for the purging thereof for a predetermined period after such sulfur trioxide conditioning mixture is no longer being directed therethrough; means for maintaining said purge flow of air at a temperature above the dew point of sulfur trioxide during substantially the entire purge period.

4,333,747

APPARATUS FOR RAPIDLY AND CONTINUOUSLY DEFOAMING LIQUID MATERIAL

Chiu H. Yang, and Zau C. Hong, both of 24 An Ching St., San Chung, Taipei, Taiwan

Filed Sep. 24, 1980, Ser. No. 190,336
Int. Cl.[3] B01D *19/00*
U.S. Cl. 55—178 3 Claims



1. An apparatus for defoaming a liquid containing a gas comprising:

a cylindrical vessel having a top, a bottom, an interior and an axis;

a partition board longitudinally dividing the interior of the vessel into an upper chamber and a lower chamber, said partition board having a plurality of small holes at the circumferential periphery thereof communicating the upper chamber with the lower chamber;

a casing surrounding the vessel;

a first sleeve axially connected to the top of the vessel rotatably mounting the vessel in the casing;

a liquid feed pipe stationarily mounted in the first sleeve having an annular clearance between the first sleeve and the feed pipe, the feed pipe opening into the upper chamber;

means for rotating the vessel in the casing operatively associated with the first sleeve;

means for creating a partial vacuum in the vessel connected to the interior of the vessel via said clearance; and

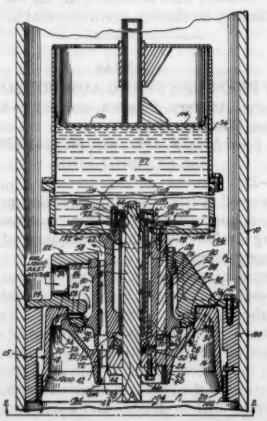
means for discharging defoamed liquid opening into the lower chamber comprising a second sleeve rotatably, axially connected to the bottom of the vessel, a discharge stationarily mounted in the second sleeve and a pair of pipes which are S-shaped in plan view fixedly mounted in the lower chamber on said discharge pipe, said S-shaped pipes each having a scoop opening at its end furthest from the axis of the vessel.

4,333,748

ROTARY GAS/LIQUID SEPARATOR

John W. Erickson, Huntington Beach, Calif., assignor to Baker International Corporation, Orange, Calif.

Continuation of Ser. No. 939,479, Sep. 5, 1978, abandoned. This application Jan. 14, 1980, Ser. No. 111,784
Int. Cl.[3] B01D *53/24*
U.S. Cl. 55—202 36 Claims



1. A gas/liquid separator comprising:

a housing;

a free-running rotor mounted for rotation about a vertical axis in the housing, the rotor having a downwardly extending inside surface and being open at its lower end;

means for directing a gas/liquid mixture into the inside of the rotor for rotating the rotor;

a chamber in the housing below the rotor for receiving separated gas and liquid; and

a plurality of fan blades on the rotor in gas communication with the chamber for discharging gas from the chamber at a pressure higher than the pressure in the chamber.

4,333,749
DRIFT ELIMINATOR STRUCTURE FOR COUNTERFLOW WATER COOLING TOWER

Joyce D. Holmberg, Overland Park, and Ohler L. Kinney, Jr., Leawood, both of Kans., assignors to The Marley Company, Mission, Kans.

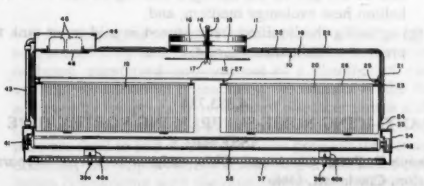
Filed Oct. 24, 1980, Ser. No. 200,461
Int. Cl.³ B01D *45/16, 51/10*
U.S. Cl. 55—257 PV **7 Claims**

1. A drift eliminator, comprising:
structure including walls defining a plurality of elongated, discrete cells for passage of moisture-laden air therethrough,
each of said cells presenting first, second and third elongated air diversion sections therealong defined by corresponding wall sections,
the longitudinal axes of said first and second sections being at an angle relative to one another,
the longitudinal axes of said second and third sections being at an angle relative to one another,
the longitudinal axes of said first and second sections being disposed in a first plane,
the longitudinal axis of said third section being disposed at an angle relative to said first plane,
said wall sections being joined to one another in end-to-end relationship such that said cells are free of discontinuities along the length thereof,
said structure including continuous, spaced, opposed, face-to-face wall members presenting first, second and third generally planar regions corresponding to said diversion sections with continuous, individually corrugated wall elements separate from said wall members and disposed between and secured to the adjacent faces of respective pairs of said wall members.

4,333,750
FILTRATION MODULE WITH INCLUDED ILLUMINATION

Martin C. Helmus, 2525 Knollview, SW., Wyoming, Mich. 49509, and Wallace L. Baker, 4505 Hersman, SE., Grand Rapids, Mich. 49506

Filed Feb. 20, 1981, Ser. No. 236,437
Int. Cl.³ B01D *50/00*
U.S. Cl. 55—259 **3 Claims**

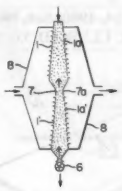


1. A filtration unit including a housing provided with an intake opening adapted for connection to a duct system, said housing also having a receptacle portion adapted to receive a filter element, a filter element removeably received in said receptacle portion said housing having an outlet opening on the opposite side of said receptacle portion from said intake opening, said unit also having disengageable means attached to said housing and adapted to releaseably secure a filter element in said receptacle portion, said means being accessible through said outlet opening, wherein the improvement comprises:
light means disposed within said outlet opening, said light means including socket means and at least one replaceable bulb normally received in said socket means and further including electrical components mounted on said housing and accessible through said outlet opening in the absence of a filter element from said receptacle portion.

4,333,751
MULTI-STAGE MOVING BED TYPE ADSORPTION DEVICE

Seiji Iwamura, and Hiromi Tanaka, both of Abiko, Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Aug. 11, 1980, Ser. No. 177,300
Claims priority, application Japan, Aug. 16, 1979, 54-104700
Int. Cl.³ B01D *53/08, 46/34*
U.S. Cl. 55—390 **2 Claims**



1. A multi-stage, moving bed-type, adsorption apparatus, comprising:
a gas-circulating vessel having a gas inlet and a gas outlet for gas to be treated;
a plurality of adsorption chamber units, said adsorption chamber units being located inside said vessel between said gas inlet and said gas outlet, and filled with adsorbent particles and being arranged in vertical alignment one above the other so that adsorbent particles can flow downwardly through said units in series; each of said adsorption chamber units comprising opposed, upwardly extending, horizontally spaced-apart, front and rear, upper walls, said upper walls comprising louvers so that gas can be fed through the louvers in one of said upper walls and can be discharged through the louvers in the other of said upper walls, the upper ends of said upper walls being horizontally spaced from each other to define an inlet for said adsorbent particles, said upper walls diverging with respect to each other in the downward direction; opposed, horizontally spaced-apart, front and rear, lower walls extending downwardly from the lower ends of said front upper wall and said rear upper wall, respectively, said lower walls converging toward each other in the downward direction with the lower ends of said lower walls being horizontally spaced from each other to define an outlet for adsorbent particles; a pair of side walls extending between said front and rear, upper and lower walls at the opposite ends thereof, respectively, for closing the space therebetween so that said upper, lower and side walls define a chamber for containing said adsorbent particles, a horizontal rectifying body which is of inverted V-shape in cross section and a vertical rectifying plate extending downwardly from the apex of said rectifying body, said rectifying body and said rectifying plate being centrally located in the lower portion of said chamber between said front and rear lower walls and extending horizontally between said side walls; a coupling passage extending downwardly from the adsorbent outlet of each of said adsorption chamber units, except the lowermost one thereof, to the adsorbent inlet of the adjacent

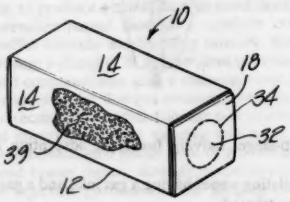
adsorption chamber unit located therebelow, each said coupling passage being located directly vertically below the rectifying body of the adsorption chamber unit disposed thereabove, each said coupling passage being defined by opposed, horizontally spaced-apart, front and rear, vertical walls which extend downwardly from the lower ends of the front and rear lower walls of the upper adsorption chamber unit to the upper ends of the front and rear upper walls of the adjacent lower adsorption chamber unit so that adsorbent particles leaving the adsorbent outlet of the upper adsorption chamber unit flow through said coupling passage into the adsorbent inlet of the adjacent lower adsorption chamber unit; and an adsorbent particle discharging means provided at the adsorbent outlet of the lowermost adsorption chamber unit.

4,333,752

ADSORBENT CARTRIDGE FOR THE EXHAUST OF DIAZO PROCESS MACHINES

Edward J. Thies, Detroit, and Norman Michlin, Southfield, both of Mich., assignors to Michlin Chemical Corporation, Detroit, Mich.

Filed Jan. 14, 1980, Ser. No. 111,516
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—387 **10 Claims**



1. A disposable cartridge for processing ammonia-laden exhaust gasses from a diazo process printing machine, comprising:

an elongated tubular container, rectangular in cross section having its opposed ends closed off by first end flaps integrally secured to one side wall of the container;

second end flaps at each end of the container formed by extensions of side walls thereof adjacent to the one side wall to which the first end flaps are secured, said second end flaps having central apertures therein;

means formed in each first end flap to allow the manual removal of a central section in the first end flaps;

screens secured to each of said second end flaps so as to cover the apertures therein; and

an ammonia adsorbent material disposed within the container, between the screens, whereby the first end flaps close off the container ends prior to use of the cartridge and the central sections of each first end flap may be manually removed when the cartridge is to be placed into use so that the exhaust from the diazo printer may be passed into the cartridge through one end screen to contact the adsorbent, and out of the cartridge through the other end screen.

7. A cartridge for use in connection with a diazo printing machine, operative to process exhaust gasses derived from the machine to render the gasses less noxious comprising:

a corrugated cardboard box, rectangular in cross section, having four elongated closed sides and sets of three end flaps formed at each of the longitudinally displaced ends of the box, each end flap in a set being secured to the end of a different side wall of the box to project outwardly therefrom in a foldable manner;

apertures formed centrally through two of the flaps secured to opposite end sidewalls in each set;

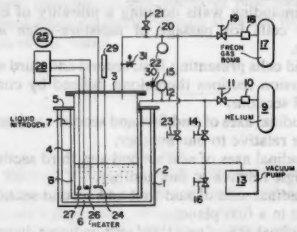
a pair of screen members, one secured at each end of the container by being sandwiched between and adhered to said two end flaps in each set so that the screen extends normally to the longitudinal axis of the container and covers the apertures in the two end flaps, and means formed in each of the center flaps of each set for removing a central section from such end flap whereby the center end flap of each set may be disposed over said screens so as to close off the screens prior to placement of the cartridge in use and when the cartridge is ready for use the center section of each of the two center end flaps of a set may be manually removed so that exhaust gasses from a diazo printing machine may be passed into the cartridge through one of the end screens and may exit from the cartridge from the other end; and an ammonia adsorbent media disposed within the box.

4,333,753

METHOD OF LIQUEFYING FREON GAS

Yasuo Kurasoka, Sapporo, Japan, assignor to Hoxan Corporation, Sapporo, Japan

Filed Jul. 10, 1980, Ser. No. 168,441
Int. Cl.³ F25J *1/00*
U.S. Cl. 62—9 **1 Claim**



1. A method of liquefying Freon gas, comprising the steps of:

(a) evacuating to a vacuum an empty inner tank;

(b) forming an outer jacket about said inner tank to define a heat exchange first space which is to be occupied by a heat exchange medium;

(c) inserting said inner tank with its jacket into an outer tank of somewhat larger periphery than said inner tank and jacket to define a cooling second space between the inner wall of said outer tank and the outer wall of said jacket, so that a cooling medium can be introduced into said second space;

(d) feeding a liquified nitrogen cooling medium into said second space so as to fill up said second space;

(e) feeding helium into said first space as a heat exchange medium and sealing said helium in said first space so that the absolute pressure thereof is substantially at atmospheric pressure or at a slightly negative pressure thereto;

(f) feeding Freon gas to said inner tank vacuum to liquify said Freon gas by the nitrogen cooling medium and the helium heat exchange medium; and,

(g) agitating the liquified freon stored in said inner tank to prevent solidification thereof.

4,333,754

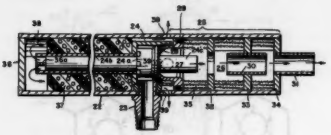
ANTI-ICING NOISE-SUPPRESSING VORTEX TUBE ASSEMBLY

Joseph E. Peter, Cincinnati, Ohio, assignor to Vortec Corporation, Cincinnati, Ohio

Filed Jun. 27, 1979, Ser. No. 52,347
Int. Cl.³ F25B *9/02*; F01N *1/00*
U.S. Cl. 62—5 **11 Claims**

1. An anti-icing noise-suppressing vortex tube assembly comprising a vortex tube having a generally cylindrical generator body provided with a compressed air inlet, a hot air outlet tube projecting from one end of said body, and a cold air outlet

tube coaxial with said hot air inlet tube and projecting from the opposite end of said body; a heat-conductive outer tubular casing disposed about said vortex tube; a noise-suppressing muffler having a thermally-conductive tubular muffler casing secured to said outer casing and having noise-suppressing means disposed therein; said muffler casing having an inlet at one end communicating directly with said cold air outlet tube and having a discharge nozzle at the other end thereof coaxial



with said muffler inlet; deflecting means provided by said outer casing for redirecting hot air discharged from said hot air outlet tube back through said outer casing toward said muffler, and also causing heating of said conductive outer casing for transmitting heat by conduction to said muffler, for preventing excessive icing of said muffler; said outer casing having a hot air discharge port formed in the wall thereof for the separate discharge of hot air in a direction other than the direction of discharge of cold air from said nozzle.

4,333,755

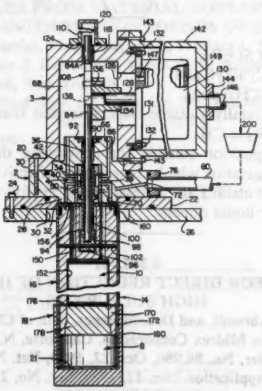
CRYOGENIC APPARATUS

Domenico S. Sarcia, Carlisle, Mass., assignor to Oerlikon-Buhrle U.S.A. Inc., New York, N.Y.

Continuation-in-part of Ser. No. 89,274, Oct. 29, 1979, Pat. No. 4,305,741. This application Mar. 30, 1981, Ser. No. 248,988

Int. Cl.³ F25B *9/00*

U.S. Cl. 62—6 **16 Claims**



1. In a cryogenic refrigerator in which (a) fluid under pressure is cooled by heat exchange and expansion in the course of its being transferred into and out of a chamber of variable volume via a thermal regenerator, (b) transfer of the fluid is achieved by reciprocal movement of displacer means and (c) a cyclically operating valve means controls introduction of high pressure fluid to and discharge of low pressure fluid from that chamber, the improvement comprising a displacer, cylinder means cooperating with the displacer so as to define first and second chambers with said first chamber having a volume which varies according to movement of the displacer within the cylinder means, conduit means and a thermal regenerator connecting said first and second chambers, means connected to said displacer for reciprocating said displacer in said cylinder means, and a control valve for controlling the flow of a refrigerant fluid to and from said first chamber, said control valve comprising a high pressure inlet port, a low pressure outlet port, and a valve member movable between first and second positions and arranged so that it connects said inlet and outlet ports to said second chamber when in said first and second positions respectively, and means for (a) causing said valve member to be shifted to said first position by said displacer as said displacer moves in a first direction and (b) causing said valve member to be shifted to said second position by said displacer as said displacer moves in a second opposite direction.

4,333,756

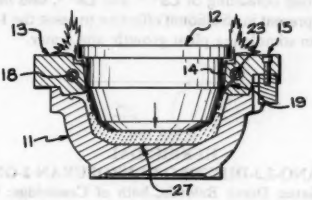
METHOD FOR PRODUCING A PRESSED GLASS ARTICLE

Thomas A. Seeman, 1152 Juliet, Toledo, Ohio 43614

Filed Mar. 9, 1981, Ser. No. 241,491

Int. Cl.³ C03B *40/02*

U.S. Cl. 65—25.1 **2 Claims**



1. In a method for producing a pressed glass article, which method includes the steps of advancing a plunger into a gob of softened glass in a mold while causing a gas to flow from a manifold around the exterior of the plunger, the improvement wherein the gas caused to flow from the manifold is a cold mixture of at least one alkane and at least the unsaturated hydrocarbon and the proportion of alkane to unsaturated hydrocarbon is controlled so that a substantially invisible lubricious coating is deposited on the plunger.

4,333,757

MUSHROOM-GROWING MEDIUM

Ralph H. Kurtzman, Jr., Berkeley, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 21, 1980, Ser. No. 132,597

Int. Cl.³ C05F *11/08*

U.S. Cl. 71—5 **17 Claims**

1. A process for preparing a cellulosic medium for growing mushrooms, which comprises the steps of

(a) fermenting a liquid mixture containing sources of soluble carbon and nitrogen under aerobic conditions, the ratio of the nitrogen source to the carbon source being 11–13 parts of nitrogen source per 100 parts of soluble carbon source such as to result in a drop in pH of the mixture to about 4.0–6.0 during the fermentation,

(b) mixing the fermented liquid mixture with an amount of water sufficient to reduce the nitrogen content of the mixture to about 0.1–0.5% based on the weight of the mixture and calculated from the initial content of nitrogen in the added source thereof,

(c) incorporating into the fermented liquid mixture a source of calcium ions in the proportion of about 0.005–0.08 parts by weight of calcium ions per part by weight of cellulosic material,

(d) heating the fermented liquid mixture to a temperature of about 65°–80° C.,

(e) contacting the fermented liquid mixture with cellulosic material, and

(f) holding the cellulosic material at a pH of about 6.5–7.5 and at a temperature and for a time sufficient to allow

substantial reduction of organisms detrimental to mushroom culture.

4,333,758
1-TRIACONTANOL PLANT GROWTH STIMULATOR FORMULATIONS

Andrew J. Welebir, 1008 Steeples Ct., Falls Church, Va. 22046

Continuation-in-part of Ser. No. 47,696, Jun. 12, 1979. This application May 2, 1980, Ser. No. 146,005

Int. Cl.³ A01N *59/00*

U.S. Cl. 71—80 **16 Claims**

1. A plant growth stimulator formulation, consisting essentially of:

an effective plant growth stimulating amount of 1-triacontanol; a water soluble or miscible polar organic solvent in which 1-triacontanol is soluble; metal ions selected from the group consisting of Ca^{++} and La^{+3}, said metal ions being present in an amount effective to assist the 1-triacontanol in stimulating plant growth; and water.

4,333,759
HERBICIDAL 5-CYANO-2,3-DIHYDRO-BENZOFURAN-2-ONES

Peter S. Gates; Derek Baldwin, both of Cambridge; Carol A. Wilson, Saffron Walden, and John Gillon, Cambridge, all of England, assignors to Fisons Limited, London, England

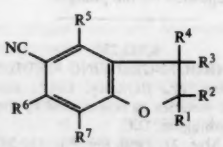
Division of Ser. No. 62,511, Jul. 27, 1979, Pat. No. 4,263,037. This application Dec. 4, 1980, Ser. No. 213,151

Claims priority, application United Kingdom, Jul. 29, 1978, 31646/78; Oct. 24, 1978, 41692/78

Int. Cl.³ A01N *43/12;* **C07D** *307/88*

U.S. Cl. 71—88 **6 Claims**

1. A 2,3-dihydro-5-cyanobenzofuran of the formula:



(I)

wherein R^1 and R^2 together represent =0; R^3 and R^4 together represent alkylene of 3 to 6 carbon atoms, or each represents hydrogen or alkyl of 1 to 6 carbon atoms; and R^5, R^6 and R^7, which may be the same or different, each represent hydrogen, halogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, alkanoyl of 2 to 6 carbon atoms or cyano.

6. A method of combating weeds at a locus infested or liable to be infested with them, which method comprises applying to the locus a herbicidally effective amount of one or more compounds according to any one of claims **3**, **4**, and **1**.

4,333,760
HERBICIDAL SULFONAMIDES

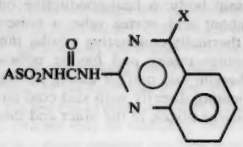
William T. Zimmerman, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 180,483, Aug. 22, 1980, abandoned. This application Jun. 9, 1981, Ser. No. 269,510

Int. Cl.³ A01N *43/54;* **C07D** *239/84*

U.S. Cl. 71—92 **21 Claims**

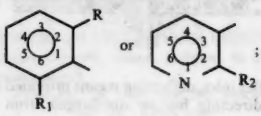
1. A compound selected from:



1

where

A is



R is NO_2, CF_3, COR_3, $S(O)_mR_4$, $SO_2NR_5R_6$ or $SO_2N(CH_3)(OCH_3)$;

R_1 is H, Cl or CH_3;

R_3 is C_1–C_3 alkyl, C_1–C_3 $OCH_2CH{=}CH_2$, OCH_2CH_2Cl, $OCH_2CH_2OCH_3$, NR_7R_8 or C_1–C_3 alkylthio;

m is 0, 1 or 2;

R_4 is C_1–C_3 alkyl;

R_5 and R_6 are independently C_1–C_2 alkyl;

R_7 is C_1–C_2 alkyl or OCH_3;

R_8 is C_1–C_2 alkyl or

R_7 and R_8 can be taken together to form

R_2 is Cl or SO_2R_9;

R_9 is C_1–C_3 alkyl; and

X is H or CH_3; and

their agriculturally suitable salts; provided that when R_7 is OCH_3 then R_8 is CH_3.

8. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim **1** and at least one of the following: surfactant, solid or liquid diluent.

4,333,761
METHOD FOR DIRECT REDUCTION OF IRON USING HIGH SULFUR GAS

William A. Ahrendt, and Donald Beggs, both of Charlotte, N.C., assignors to Midrex Corporation, Charlotte, N.C.

Division of Ser. No. 86,980, Oct. 22, 1979, Pat. No. 4,270,739. This application Dec. 12, 1980, Ser. No. 215,782

Int. Cl.³ C21B *13/02*

U.S. Cl. 75—35 **7 Claims**

1. A method of reducing iron oxide to metallized iron comprising:

(a) establishing a gravitational flow of particulate iron oxide material through a generally vertical shaft furnace by charging such material to the upper portion of said shaft furnace and removing metallized iron product from the bottom of said furnace;

(b) selecting a sulfur-containing process gas from the group comprising coke oven gas, natural gas and blast furnace gas;

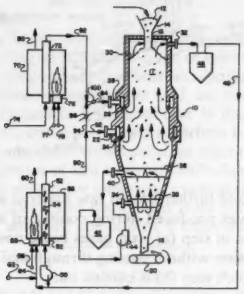
(c) heating said process gas to a temperature of at least 600° C.;

(d) mixing said heated process gas with hot reformed reducing gas to form a hot reducing gas mixture;

(e) introducing said reducing gas mixture to said gravita-

tional flow of material in said shaft furnace intermediate the ends of said furnace;

(f) causing said reducing gas mixture to flow countercurrently through said gravitational flow of material desulfurizing the reducing gas, reducing the iron oxide material to metallized iron and forming a low sulfur top gas;



(g) removing said top gas from said furnace, cooling and scrubbing said removed top gas; and

(h) heating said removed top gas in the presence of a catalyst to form said hot reformed reducing gas, whereby the sulfur content of said removed top gas is too low to poison the catalyst.

4,333,762

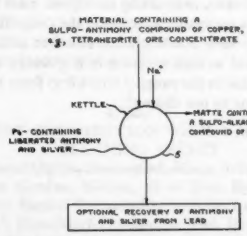
LOW TEMPERATURE, NON-SO_2 POLLUTING, KETTLE PROCESS FOR THE SEPARATION OF ANTIMONY VALUES FROM MATERIAL CONTAINING SULFO-ANTIMONY COMPOUNDS OF COPPER

Carl R. Di Martini, Piscataway, N.J.; William L. Scott, Tampa, Fla., and Leo J. Bulvanoski, Fords, N.J., assignors to Asarco Incorporated, New York, N.Y.

Filed Mar. 20, 1980, Ser. No. 132,240

Int. Cl.³ C22B *30/02*

U.S. Cl. 75—69 **12 Claims**


MATERIAL CONTAINING A SULFO-ANTIMONY COMPOUND OF COPPER, e.g., TETRAHEDRITE ORE CONCENTRATE
Na°
KETTLE
MATTE CONTAINING A SULFO-ALKALI METAL COMPOUND OF COPPER
Pb- CONTAINING LIBERATED ANTIMONY AND SILVER
5
OPTIONAL RECOVERY OF ANTIMONY AND SILVER FROM LEAD

1. A process for separating antimony values from a material containing a sulfo-antimony compound of copper without the use of a reverberatory or blast furnace which comprises:

(a) establishing a pool of molten lead;

(b) adding metallic alkali metal to the molten lead pool in an amount sufficient to reduce the desired amount of combined antimony in the sulfo-antimony compound of copper to metallic antimony;

(c) adding the material containing the sulfo-antimony compound of copper to the molten lead pool;

(d) mixing together the metallic alkali metal, molten lead, and material containing the sulfo-antimony compound of copper whereupon the metallic alkali metal reacts with the material containing the sulfo-antimony compound of copper to reduce the combined antimony therein to zero valent, elemental antimony;

(e) forming a low melting copper sulfide-alkali metal sulfide matte phase which separates from the molten lead pool;

(f) passing the liberated metallic antimony into the molten lead pool; and

(g) separating the low melting matte phase from the pool containing the antimony.

4,333,763

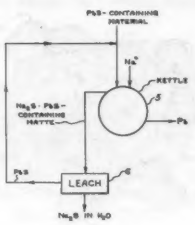
LOW TEMPERATURE, NON-SO_2 POLLUTING, KETTLE PROCESS FOR SEPARATION OF LEAD FROM LEAD SULFIDE-CONTAINING MATERIAL

Carl R. Di Martini, Piscataway; Herbert E. Howe, North Plainfield, both of N.J.; William L. Scott, Tampa, Fla., and Leo J. Bulvanoski, Fords, N.J., assignors to Asarco Incorporated, New York, N.Y.

Filed Mar. 20, 1980, Ser. No. 132,239

Int. Cl.³ C22B *13/00*

U.S. Cl. 75—77 **20 Claims**



1. A process for separating lead from a material containing lead sulfide which comprises:

(a) establishing a pool of molten lead in a kettle;

(b) incorporating metallic alkali metal in the lead pool;

(c) the alkali metal being incorporated in the molten lead in an amount sufficient to reduce the combined lead in lead sulfide to metallic lead;

(d) adding the material containing lead sulfide to the molten lead;

(e) mixing together the metallic alkali metal, molten lead, and the lead sulfide-containing material wherein the mixing together is carried out at a temperature of the molten lead pool in the range above the melting point of the metallic lead up to but not above 650° C.;

(f) the metallic alkali metal reacting with the lead sulfide to reduce the combined lead of the lead sulfide to metallic lead;

(g) a matte phase comprising a sulfur compound of the alkali metal separating from the molten lead;

(h) the thus-liberated metallic lead reporting in the molten lead pool, and a sulfur compound of the alkali metal being present in the matte phase; and

(i) separating the matte phase from the lead pool.

4,333,764

NITROGEN-GAS-STABILIZED CEMENT AND A PROCESS FOR MAKING AND USING IT

Edwin A. Richardson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 21, 1981, Ser. No. 227,027

Int. Cl.³ C04B *21/02*

U.S. Cl. 106—87 **8 Claims**

1. In a well treating process in which an aqueous slurry of cement is pumped into a well to form a substantially impermeable set cement within a subterranean zone in which the temperature and pressure are relatively high, the improvement comprising using as said slurry:

a pumpable aqueous slurry of cement which contains dissolved within its aqueous liquid phase nitrogen-gas-generating reactants; and

said reactants (a) consist essentially of compounds that react while dissolved within the aqueous liquid (b) have a rate of reaction and a concentration within the aqueous liquid such that the rate at which they generate the gas is relatively insignificant until their concentration within that liquid is increased by the loss of aqueous liquid which accompanies the setting of the cement and (c) are present within the cement slurry in a proportion such that the volume of the gas they are capable of generating substantially equals the volume lost by the cement slurry during the setting of the cement.

4,333,765

SANDLESS CONCRETE

Arthur Shaw, 101 Stock Isle Apartments, Key West, Fla. 33040

Filed Aug. 8, 1980, Ser. No. 176,515
Int. Cl.³ C04B 7/02
U.S. Cl. 106—98 **4 Claims**

1. A method of making sandless cementitious material comprising the steps of:

forming an aqueous suspension of silicon dioxide of 100 mesh or finer;

sizing an aggregate in said aqueous suspension, said aggregate being predominantly comprised of aggregate elements having a size in the range between 0.05 and 3 inches, each cubic yard of said aggregate being sized with 10 to 35 pounds of silicon dioxide in 10 to 25 gallons of water;

adding between 150 and 600 pounds of cement to each cubic yard of said sized aggregate in said suspension; and

permitting the mixture of water, sized aggregate and cement to cure.

4,333,766

CALCIUM PROCESS FOR MANUFACTURING SILICATE AND/OR ALUMINATE BASED PRODUCTS

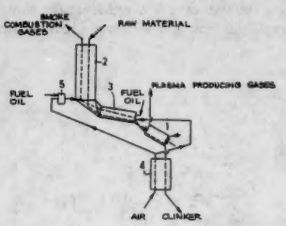
Jacques Moisset, Fourqueux; Claude Bonet, Saint-Cyr en Val; Alain Rouanet, Font-Romeu; Alain Petit, and Robert Delmas, both of Mont-Louis, all of France, assignors to Lafarge, Paris, France

Filed Sep. 18, 1980, Ser. No. 188,504
Claims priority, application France, Sep. 24, 1979, 79 23737
Int. Cl.³ C04B 7/02
U.S. Cl. 106—100 **14 Claims**

1. A process for manufacturing clinker containing more than 50% by weight of a raw material selected from the group consisting of tricalcium silicate, dicalcium silicate, calcium metasilicate, monocalcium aluminate, and slags, said process comprising the steps of:

(a) heating in a first enclosure a solid raw material containing calcium carbonate to an elevated temperature sufficient to decarbonate the calcium carbonate, including the step of bringing hot gases into direct counterflow contact with the raw material;

(b) further heating the raw material in a second enclosure in the presence of a reducing gas to a temperature greater than 1500° C. so as to obtain fusion of more than 80% of the raw material, including the step of maintaining impurity containing hot gases generated during said further heating step out of contact with the raw material during step (a); and



(c) cooling said further heated raw material and conveying the hot gases produced during cooling of said raw material for use in step (a), said gases being conveyed to said first enclosure without passing through said second enclosure in which step (b) is carried out.

4,333,767

METHOD FOR THE MANUFACTURE OF AN ADHESIVE FROM ANIMAL BLOOD

Arno Nass, Hameln, Fed. Rep. of Germany, assignor to Bison-Werke Bahre und Greten GmbH & Co., KG, Springe, Fed. Rep. of Germany

Filed Dec. 14, 1979, Ser. No. 103,715
Claims priority, application Fed. Rep. of Germany, Jan. 9, 1979, 2900621
Int. Cl.³ C09J 3/24
U.S. Cl. 106—161 **9 Claims**

1. A method of manufacturing an adhesive from animal blood comprising adding a diluent in the form of sodium chloride to the blood to form a mixture which is then dried and stored as a dried mass, converting said dried mass by the addition of water to a sprayable solution in the range from 13% up to approximately 40% concentration and then adding a monobasic organic acid to said solution in a quantity sufficient to produce a ph value in the range 3.0 to 4.0 to form the adhesive immediately prior to use thereof.

4,333,768

TECHNIQUE TO REDUCE THE ZEOLITE MOLECULAR SIEVE SOLUBILITY IN AN AQUEOUS SYSTEM

Santi Kulprathipanja, Hoffman Estates, and Herman S. Bloch, Skokie, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 18, 1980, Ser. No. 217,945
Int. Cl.³ C13D 3/14
U.S. Cl. 127—46.2 **9 Claims**

1. A process for the separation of a component from a feed mixture comprising an aqueous solution of a mixture of components by contacting said solution with an adsorbent consisting essentially of a crystalline aluminosilicate and a cellulose ether binder to reduce the extent of disintegration of said adsorbent, wherein said adsorbent exhibits adsorption selectivity towards said component to separate said component from said feed mixture and thereafter recovering said selectively adsorbed component.

4,333,769

TECHNIQUE TO REDUCE THE ZEOLITE MOLECULAR SIEVE SOLUBILITY IN AN AQUEOUS SYSTEM

Santi Kulprathipanja, Hoffman Estates, and Richard W. Neuzil, Downers Grove, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 146,533, May 2, 1980. This application Dec. 18, 1980, Ser. No. 217,946

Int. Cl.³ C13D 3/14

U.S. Cl. 127—46.2 9 Claims

1. A process for the separation of a component from a feed mixture comprising an aqueous solution of a mixture of components by contacting said solution with an adsorbent comprising both a crystalline aluminosilicate and an inorganic matrix wherein said crystalline aluminosilicate is dispersed in said inorganic matrix, and wherein said adsorbent is coated on the outside of said adsorbent with a cellulose ether to substantially reduce disintegration of said adsorbent and wherein said adsorbent exhibits an adsorptive selectivity towards said component to selectively adsorb said component from said mixture, and thereafter said adsorbed component is recovered.

4,333,770

EXTRACTION OF SUCROSE FROM MOLASSES

Richard W. Neuzil, Downers Grove, and Richard L. Fergin, Mount Prospect, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Sep. 8, 1980, Ser. No. 185,101

Int. Cl.³ C13D 3/12

U.S. Cl. 127—46.3 4 Claims

1. A process for separating sucrose from an aqueous mixture of a sugar source containing sucrose and at least one other sugar which comprises the steps of:

(a) contacting said mixture at adsorbent conditions with an adsorbent comprising a shaped replication of inorganic support particle aggregates, said adsorbent consisting of a carbonaceous pyropolymer containing at least carbon and hydrogen atoms thereby selectively adsorbing said sucrose thereon;

(b) separating from the adsorbent a raffinate stream comprising at least one other sugar;

(c) contacting said adsorbent at desportion conditions with a desorbent material consisting essentially of an aqueous methanolic solution having from about 10% to about 50% methanol by weight to effect desorption of said sucrose from said adsorbent, and

(d) separating and recovering from said adsorbent an extraction stream comprising said sucrose.

4,333,771

DETERGENT COMPOSITION WITH A MECHANICAL CLEANING EFFECT

Theodor Altenschöpfer, Dusseldorf; Klaus Schumann, Erkrath, and Dieter Grodau, Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Feb. 23, 1981, Ser. No. 237,063

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1980, 3007320

Int. Cl.³ B08B 3/04, 7/02; C11D 3/12, 3/14

U.S. Cl. 134—7 13 Claims

1. A detergent composition with a mechanical cleaning effect for the mechanical cleaning of hard surfaces, particularly cooking and baking utensils, comprising a mixture of granular particles consisting substantially of

(A) a powdered to granulated component of conventional mechanical dishwasher washing agents capable of rapidly dissolving or finely dispersing in water, and

(B) a granulated component comprising finely divided, water-insoluble inorganic compounds having a particle size between dust fineness and 100μ, granulated to a grain size of from 0.2 to 4 mm, and having a granular stability, as determined according to the method indicated in the disclosure, of a half value of ¼ to 3 and an end value of not more than 15% particles having a size of over 0.4 mm.

12. In a method for cleaning hard surfaces of cooking utensils in a mechanical dishwasher comprising the steps of subjecting the dirty surfaces of cooking utensils to the action of a pressurized washing solution containing conventional water-soluble to water-dispersible detergent components and a granulated component capable of a mechanical scrubbing action, for a time sufficient to cleanse said dirty surfaces, rinsing said cleansed cooking utensils and recovering cleaned cooking utensils, the improvement consisting of using a granulated component comprising finely-divided, water-insoluble inorganic compounds having a particle size between dust fineness and 100μ, granulated to a grain size of from 0.2 to 4 mm, and having a granular stability, as determined according to the method indicated in the disclosure, of a half value of ¼ to 3 and an end value of not more than 15% particles having a size of over 0.4 mm, as said granulated component, wherein said granulated component breaks down to a finely-divided, water-insoluble component during the washing process.

4,333,772

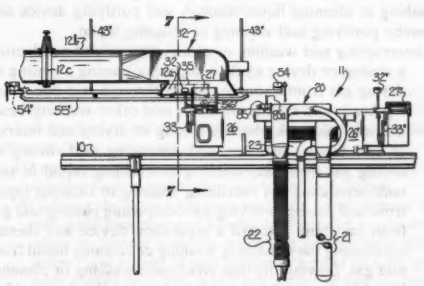
TRAVELING PNEUMATIC CLEANER AND AUTOMATIC UNLOADING ARRANGEMENT AND METHOD

William L. Mulligan, and Thomas R. House, both of Charlotte, N.C., assignors to Parks-Cramer Company, Fitchburg, Mass.

Filed Jun. 18, 1980, Ser. No. 160,823

Int. Cl.³ A47L 5/38

U.S. Cl. 134—18 20 Claims



20. A method of handling fiber waste created by textile machines comprising the steps of

directing a plurality of traveling pneumatic cleaners along respective predetermined paths of travel associated with respective groups of the textile machines while collecting fiber waste generated by each group of the textile machines in a fiber waste collection chamber on the respective traveling cleaner,

providing a respective unloading station adjacent the path of travel of each traveling cleaner with all the unloading stations connected to a common source of suction,

repeatedly moving each traveling cleaner past its respective unloading station, and

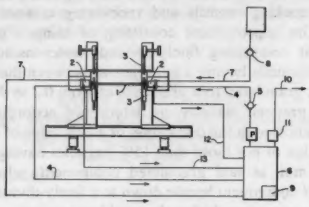
during only certain movements of each traveling cleaner past its respective unloading station effecting transfer of collected fiber waste from the collection chamber of the respective traveling cleaner into the respective unloading station by the suction air flow being induced by the common source of suction, while concurrently preventing the transfer of fiber waste from the collection chambers of the respective other traveling cleaners into said any other of the unloading stations.

4,333,773

METHOD FOR INTERNAL WASHING OR CLEANING AND RINSING OR DRYING OF TUBULAR MATERIALS

Bengt Fjällström, Södra Kungsvägen 9, Tidaholm, Sweden

Filed Sep. 23, 1980, Ser. No. 190,097
Claims priority, application Sweden, Jun. 19, 1980, 80045651
Int. Cl.³ B08B 9/00
U.S. Cl. 134—22 C 5 Claims



1. A method for the internal washing or cleaning and the rinsing or drying of a tubular member, said process comprising:

connecting the opposite ends of a tubular member to be cleaned to a pair of washing heads;

providing a tank of washing or cleaning liquid having a purifying device;

during a washing or cleaning cycle, circulating in a closed system the washing or cleaning liquid from said tank, through one of said washing heads, said tubular member, the other of said washing heads, and back to said tank, thus cleaning the interior of said tubular member, passing the thus returned washing or cleaning liquid through said purifying device and thereby purifying said washing or cleaning liquid;

interrupting said washing or cleaning cycle and conducting a rinsing or drying cycle comprising passing a rinsing or drying gas from a source thereof through said one washing head, said tubular member, said other washing head, and into said tank, thereby rinsing or drying said interior of said tubular member, and separating said rinsing or drying gas from said washing or cleaning liquid in said tank; separating any remaining washing or cleaning liquid from said rinsing or drying gas comprising passing said gas from said tank through a separation device and therein condensing the remaining washing or cleaning liquid from said gas, flowing the thus condensed washing or cleaning liquid back to said tank, and discharging the thus purified gas through a discharge tube; and

interrupting said rinsing or drying cycle and removing said tubular member from said washing heads.

4,333,774

METHOD FOR PRODUCING WALLED EMITTER TYPE BIPOLAR TRANSISTORS

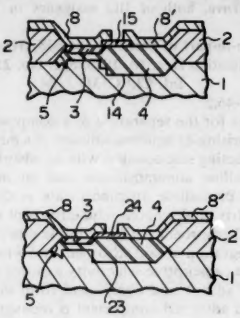
Hajime Kamioka, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 14, 1980, Ser. No. 130,535
Claims priority, application Japan, Mar. 20, 1979, 54/33113
Int. Cl.³ H01L 21/26, 21/225
U.S. Cl. 148—1.5 18 Claims

1. A method for producing, on a semiconductor body of a first conductivity type, a bipolar transistor which is isolated by an insulating layer and which has an emitter region that is in contact with said insulating layer and a base region, comprising the steps of:

forming a first insulating film on a part of the semiconductor body and a part of said insulating layer prior to the formation of the base region;

forming a second insulating film, which is smaller than said first insulating film, on said first insulating film above a part of said semiconductor body corresponding to said emitter region; and



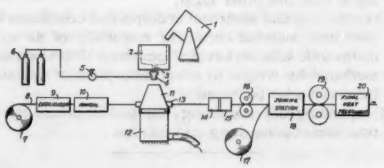
forming the base region by an ion implantation process.

4,333,775

METHOD OF PRODUCING ALUMINUM ALLOY COMPOSITE

Duraid Mahrus, Sao Paulo, Brazil, assignor to Metal Leve S.A. Industria e Comercio, Brazil

Continuation-in-part of Ser. No. 56,189, Jul. 10, 1979, abandoned. This application Jul. 1, 1980, Ser. No. 165,054
Claims priority, application Brazil, Jul. 14, 1978, 7804586[U]
Int. Cl.³ C22F 1/04
U.S. Cl. 148—11.5 Q 7 Claims



1. Method of producing Al-Pb alloy low-friction composite suitable for the manufacture of bearing materials, which comprises forming an alloy melt of 5 to 20% lead in aluminum, atomizing said melt by the impingement, at an angle of 20°–45° of a thin stream of said alloy with a gas stream to form a pattern of liquid particles of said melt, directing said particle pattern onto a face of a moving aluminum strip under conditions such that the particles are liquid at the time of contacing the aluminum strip and solidify on said strip shortly after contact therewith to form an alloy coating thereon, compacting and rolling said coated strip to bond said coating to said aluminum strip and form an alloy composite of said Al-Pb alloy bonded to said aluminum strip.

4. The method according to claim 1 wherein the aluminum strip coated with the pattern of particles is subjected to heat treatments and rolling operations to eliminate porosities in the coating.

5. The method according to claim 4 wherein said composite is further heat treated and juxtaposed to a steel supporting strip and the composite bonded thereto by a further rolling operation to form a supported alloy material suitable for the fabrication of bearings.

4,333,776

SEMI-FINISHED STEEL ARTICLE

Debanshu Bhattacharya, Matteson, Ill.; Dennis T. Quinto, St. John, and Michael O. Holowaty, Crown Point, both of Ind., assignors to Inland Steel Company, Chicago, Ill.

Continuation of Ser. No. 122,283, Feb. 19, 1980, abandoned, which is a division of Ser. No. 5,965, Jan. 24, 1979, Pat. No. 4,236,939. This application Jun. 8, 1981, Ser. No. 271,681

Int. Cl.³ C22C *38/00*

U.S. Cl. 148—36 4 Claims

1. An as-deformed billet of free machining steel, said billet comprising:

a composition consisting essentially of, in wt.%:

carbon	0.06–1.0
manganese	0.30–1.6
sulfur	up to 0.35
bismuth	0.10–0.40
tellurium	machinability increasing amounts up to 0.06
lead	up to 0.15
silicon	up to 0.30
phosphorus	up to 0.12
iron	essentially the balance;

the combined lead plus bismuth content being at least 0.25 wt.%;

all of said tellurium being combined substantially with said bismuth and/or said manganese as microinclusions of Bi_2Te_3 and/or MnTe;

there being substantially no FeTe;

microinclusions of elemental bismuth;

a billet surface substantially free of surface cracking and burning in the as-deformed condition;

and iron oxide on the surface of said billet in said as-deformed condition;

said billet having microinclusions of PbTe in amounts insufficient to produce substantial surface cracking during hot deforming of said billet at a temperature below 1150° C. (2100° F.).

4,333,777

METHOD AND APPARATUS FOR COMPENSATING FOR LOCAL TEMPERATURE DIFFERENCE OF STEEL PRODUCT

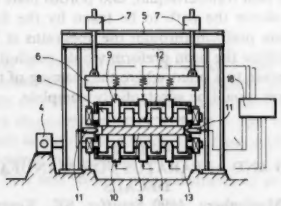
Osamu Takeuchi, Mitaka; Kiyoshi Aoki, Chiba, and Yuichi Fujii, Funabashi, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1980, Ser. No. 161,588

Claims priority, application Japan, Nov. 20, 1979, 54-150512

Int. Cl.³ C21D *11/00*

U.S. Cl. 148—128 4 Claims



1. An apparatus for compensating for local temperature difference of a sheet steel product comprising: an array of lower rollers which defines a path of travel of said sheet steel product, an array of upper rollers disposed in opposed relationship with said lower rollers, an array of lower burners positioned between said lower rollers, an array of upper burners positioned between said upper rollers, a vertically movable frame upon which are mounted said upper rollers and said upper burners so that the latter can be moved vertically toward or away from said path of travel depending upon the thickness or gauge of said sheet steel product, temperature sensing means for sensing the surface temperature distribution of said sheet steel product before said sheet steel product enters said apparatus, sheet sensing means for sensing the leading edge of said sheet steel product, an arithmetic and logical unit for comparing the outputs from said temperature sensing means with a reference temperature as well as responding to the output of said sheet sensing means, thereby detecting the portions of said sheet steel product whose local temperatures are below said reference temperature, and burner control means responsive to the output from said arithmetic and logical unit for selectively igniting one or more upper and lower burners, whereby said portions of said sheet steel product are heated and consequently the surface temperature of said sheet steel product is uniformly heated to said reference temperature.

4,333,778

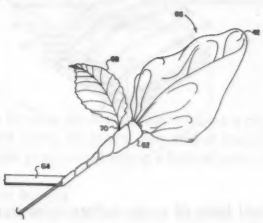
FLOWER BUD

Mary T. Griffin, 3991 Shady Hill, Dallas, Tex. 75229

Filed Feb. 7, 1980, Ser. No. 119,438

Int. Cl.³ A41G *1/00*

U.S. Cl. 156—61 19 Claims



1. A method of making an artificial flower bud from a single piece of fabric comprising:

(a) cutting a rectangular section of fabric having right and left short edges and upper and lower long edges;

(b) folding the right edge back onto said fabric section with said right edge near and substantially parallel to said lower edge, to form a bias fold extending substantially from a lower right corner of said section to a point on said upper edge spaced from the upper left corner of said section;

(c) folding the upper left corner of said section down to a point between the lower left section corner and the upper right corner;

(d) folding the lower right corner of said section over said section to a point between said upper left corner and said lower left corner;

(e) forming pleats in said left and lower edges to gather said left and lower edges into a bundle; and

(f) wrapping said bundle with a cord to permanently fix the configuration of said artificial flower bud.

4,333,779

APPARATUS AND PROCESS FOR MANUFACTURING BIO-OXIDATION AND NITRIFICATION MODULES

William R. Rinker; Harry R. Ayers, and John W. Miller, all of Cuyahoga Falls, Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 23, 1981, Ser. No. 236,967

Int. Cl.³ B06B *3/00;* B23K *19/04;* B30B *15/34;* B32B *31/20*

U.S. Cl. 156—73.1 6 Claims

1. Apparatus for manufacturing a bio-oxidation and nitrification module composed of alternating flat thermoplastic sheets and corrugated thermoplastic sheets joined together to form a unitary structure, said apparatus comprising sonic welding

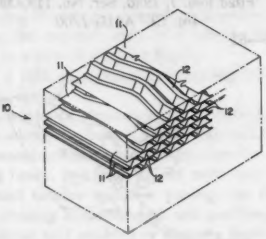
means for ultrasonically welding together a paired flat sheet and corrugated sheet of said module along their interfacial zones of contact, assembly means for receiving paired welded flat sheet-corrugated sheet components from said sonic welding means and maintaining said components in stacked relation, edge-flanger means for flanging the edges of a stack of said paired welded flat sheet-corrugated sheet components to form an edge-seam which unites the said components together and forms the unitary module structure, and carriage means for moving a stack of paired welded flat sheet-corrugated sheet components from said assembly means along a predetermined path into said edge-flanger means, said sonic welding means including:

(a) a cradle having its upper face contoured to receive one of said corrugated sheets with one of said flat sheets disposed thereupon,

(b) a bank of sonic welder units,

(c) means for moving said cradle beneath said bank of sonic welder units, and

(d) means for resiliently maintaining said welder units against the upper face of said flat sheet disposed upon said corrugated sheet nested in said cradle as said cradle is advanced



beneath said bank of sonic welder units along a predetermined path.

6. A process for making a bio-oxidation and nitrification module composed of alternating flat thermoplastic sheets and corrugated thermoplastic sheets, said process comprising:

(a) pairing together one of said flat sheets and one of said corrugated sheets used in said module and sonic welding said paired sheets together along their zones of interfacial contact by transmitting mechanical vibratory energy of ultrasonic frequency through said paired sheets while said paired sheets are maintained in physical contact,

(b) forming additional sonic-welded flat sheet-corrugated sheet components,

(c) stacking said sonic-welded flat sheet-corrugated sheet components one on top of another while maintaining an alternating flat sheet-corrugated sheet arrangement until a stack of said flat sheet-corrugated sheet components equal in height to the height of the said module to be formed is realized, and,

(d) heat-flanging the edges of said stacked flat sheet-corrugated sheet components to cause heat-welding of the edges of adjacent sheets together forming an edge-seam uniting the stacked sheets into a unitary structure.

4,333,780

SUBMERSION TREATMENT OF FOAMABLE THERMOPLASTIC SHEET ON PREFORMS

Sambasiva R. Allada, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

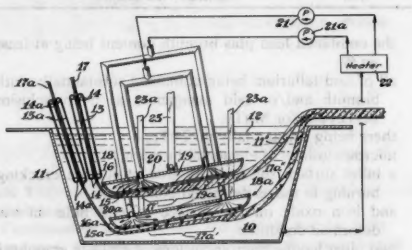
Filed Dec. 2, 1980, Ser. No. 212,179

Int. Cl.³ B29D *27/00*

U.S. Cl. 156—78 **5 Claims**

1. In a continuous method of preparing a thermoplastic foam article wherein a heat foamable crosslinked thermoplastic preform is heated to a temperature at or above the foaming temperature of the foamable preform, said foaming temperature being at or above the decomposition temperature of a blowing agent compounded in the preform and at or above the heat softening temperature of the thermoplastic resin, said heating achieved by submerging said preform into and passing it through and out of a body of a liquid heat transfer medium which is at or above the foaming temperature of the foamable preform, said preform being thereby heated and foamed during which time said preform is typically soft, sticky and/or of low tensile strength, the resulting foamed resin product then being removed from the body of the heat transfer liquid, which liquid has a greater density than the foaming and foamed resin product, the improvement wherein the foamable and foaming resin preform is held submerged while in the body of heat transfer liquid under and by a protective dynamic fluid boundary layer generated by the forced diffusion of a fluid through the pores of a stationary porous plate, said diffused fluid being at substantially the same temperature as the liquid heat transfer medium, said dynamic fluid layer separating and preventing contact between the soft, sticky, foamable, foaming and foamed resin preform and the surface of the porous plate.

5. Apparatus for continuously forming foamed resin products from heat foamable thermoplastic resin preforms, which apparatus comprises a vessel adapted for holding a body of



heat transfer liquid, means for controllably heating said liquid at a temperature above the heat foaming temperature of the foamable thermoplastic resin preform, means for continuously passing the foamable resin preform into and submerging it in the body of heat transfer liquid, whereby the foamable resin preform is heated to its foaming temperature and foams, and means for continuously taking the resulting foamed resin product out of the body of heat transfer liquid, which liquid is more dense than the foaming and foamed resin product, which apparatus also comprises and is particularly characterized by a porous plate means, through the pores of which is forcibly diffused amounts of the heat transfer liquid sufficient to generate and maintain a dynamic layer of the heat transfer liquid above resin preform and below the porous plate, the dynamic layer holding the foaming resin preform submerged while in the body of heat transfer liquid, said porous plate means being positioned above the path to be taken by the foamable and foaming resin preform through the apparatus at least from a point just before the resin preform would reach its heat foaming temperature to a point where the foaming of the foamable resin preform would be substantially complete.

4,333,781

METHOD AND APPARATUS FOR MANUFACTURING DECALS

Daniel R. Meulenberg, 4690 Stauffer, SE., Kentwood, Mich. 49508

Filed Feb. 19, 1980, Ser. No. 122,430

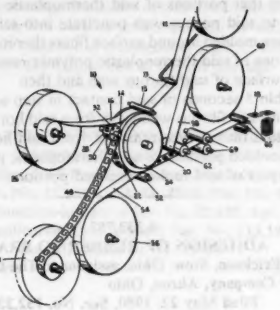
Int. Cl.³ B32B *31/00;* **C22C** *23/00;* **B07C** *5/00;* **C09J** *5/00*

U.S. Cl. 156—152 **17 Claims**

1. A method for manufacturing decals from a web of synthetic decal stock, wherein the decals have an open interior portion that requires removal of a separate core portion of waste material from the decal stock during manufacture, the method comprising:

cutting the decals in the decal stock at spaced intervals in the web;

affixing the decals to a vacuum surface wherein the decals are urged to adhere to a perforated surface by a vacuum drawn through the perforations, the perforations in the surface being small enough to prevent the decal itself from being drawn through the perforation but the vacuum surface having enlarged openings conforming in position to any waste core portions of the decal, the enlarged



openings and the vacuum being sufficient to draw the waste core material through the openings in the surface and away from the decals, leaving the decals with their desired open interior portions;

stripping away from the decals the waste portions of the decal stock on the exterior of the decals, such that the decals are retained by the vacuum on the vacuum surface; and

removing the decals from the vacuum surface.

4,333,782

METHOD OF MAKING LAMINATED STRUCTURES HAVING GATHERED AND UNGATHERED MARGINAL PORTIONS

Heinz A. Pieniak, Chicago, Ill., assignor to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Filed Feb. 11, 1980, Ser. No. 120,194

Int. Cl.³ A61F *13/16*; B32B *31/08*

U.S. Cl. 156—164 **3 Claims**

2. A method of intermittently attaching a pair of elastic members intermediate the opposing waistband portions of absorbent pads contained in a continuously moving web of interconnected disposable diapers to form a pair of discrete elastic leg bands in each of said diapers cut from said web, said method comprising the steps of:

(a) feeding first and second web substrates to an assembly station;

(b) feeding a pair of stretched elastic members, each member comprising a plurality of longitudinally extending elastic elements, intermittent portions of said elements being interconnected to define apertures therebetween with the portions of said elements between said intermittent portions being non-interconnected, to said assembly station;

(c) applying adhesive to at least one of said webs as it is being fed to said assembly station, at least a portion of said adhesive being registered such that it will lie within the area occupied by the apertured portions of said stretched elastic members;

(d) feeding absorbent pad elements having opposing waistband portions with one of said first and second webs;

(e) adhering said first web and said second web together at said assembly station through the portions of the elastic members defining apertures; and

(f) cutting said webs transversely into discrete disposable diapers along a line severing said elastic members in non-interconnected portions to allow said non-interconnected portions to relax and return to their unstretched state.

4,333,783

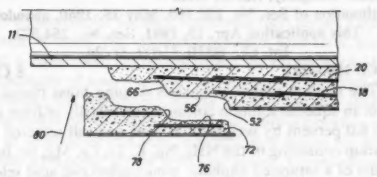
PIPE COATING APPARATUS

David L. Gardner, Rte. 23, Box 64, Conroe, Tex. 77303

Filed Aug. 22, 1980, Ser. No. 180,379

Int. Cl.³ B65H *81/00*

U.S. Cl. 156—187 **18 Claims**



1. Apparatus for placing weight material on a pipe which is axially advanced along its major axis and is rotated as it advances so that the pipe moves along a helical path, the apparatus comprising:

(a) a conveyor having

(1) an endless loop belt having an exposed top surface;

(2) a first roller within said looped belt;

(3) a second roller within said looped belt;

(4) said rollers stretching said looped belt taut to define an exposed top surface;

(5) motive means for moving said belt in endless travel around said rollers such that the top surface thereof advances in a given direction;

(b) means positioning a helically rotating pipe above said belt located to enable the top surface thereof to advance toward the pipe approaching from a lateral direction below the pipe; and

(c) means for depositing a supply of tacky weight material on the top surface of said looped belt in the form of a shaped ribbon; and

(d) cutting means for cutting the ribbon along an edge of the ribbon face after the ribbon is adhered to the pipe.

4,333,784

MACHINE AND METHOD FOR PRODUCING WEATHERPROOFED MULTI LEAF SHIPPING FORMS

Hubert McCarthy, 424 - 51st Ave. SE., Calgary, Alberta T2H OM7, Canada

Filed Mar. 20, 1980, Ser. No. 131,906

Int. Cl.³ B32B *31/20*

U.S. Cl. 156—252 **56 Claims**

1. A machine for producing multi leaf shipping forms including:

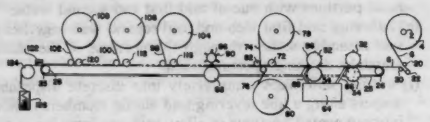
(a) means for holding a pre-printed form running length web

(b) means for relieving successive transverse portions of said web and intermediate said web and extending short of the side edges of said web

means for applying top and bottom sheets to said web

(d) means for encapsulating said web between said successive relieved portions of said web by pressure bonding said top and bottom sheets in face to face contact with

each other along the length of successive relieved portions of said web, and



(e) means for bonding one of said side edges of said web to said sheets while leaving at least a substantial portion of the other side edge of said web unbonded to at least one of said sheets.

4,333,785

ADHESION OF BRASS TO RUBBER

David E. Erickson, Stow, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 150,103, May 15, 1980, abandoned. This application Apr. 15, 1981, Ser. No. 254,572

Int. Cl.[3] B32B *31/00, 31/26*

U.S. Cl. 156—281 8 Claims

1. The method which comprises dipping brass plated steel cord in an aqueous solution consisting essentially of from about 0.5 to 6.0 percent by weight of at least one salt selected from the group consisting of the NH_4, Na, K, Li, Ca, Mg, Sr, Ba and Zn salts of a saturated aliphatic monocarboxylic acid selected from the group consisting of formic, acetic, propionic, n-butyric, isobutyric, valeric and isovaleric acids and mixtures thereof for a time and at a temperature sufficient to remove at least a substantial amount of the corrosion products on the outer surface layers of said cord and then drying the same.

5. The method according to claim 1 containing the additional step of combining said dried cord with a vulcanizable rubber compound and vulcanizing the same.

4,333,786

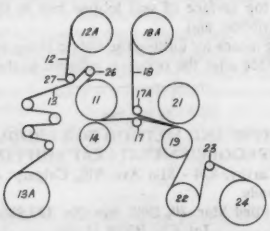
LAMINATING

Frank P. Civardi, Wayne; Stanley G. Sova, Clifton, and Milan J. Getting, Nutley, all of N.J., assignors to Inmont Corporation, Clifton, N.J.

Continuation-in-part of Ser. No. 19,235, Mar. 9, 1979, abandoned. This application Feb. 27, 1980, Ser. No. 125,002

Int. Cl.[3] B32B *1/00*

U.S. Cl. 156—306.6 17 Claims



1. Process for making a laminate which comprises:

(a) continuously feeding a macro-apertured solid web of thermoplastic polymer into contact with a hot moving surface of a continuously rotating roll, the temperature of said hot surface being above the melting temperature of said polymer, said macro-apertured polymer web having a thickness of at least about 0.07 mm and weighing about 10 to 100 grams per square meter, the polymer portions of the web thickness which are in contact with said hot surface becoming molten and adhering to said hot surface while the polymer portions of the web thickness which are more remote from said hot surface become at least softened,

(b) continuously feeding a fibrous web to said roll so that said fibrous web is in contact with said polymer on said hot surface,

(c) maintaining said thermoplastic polymer in macro-apertured condition on said surface substantially without relative movement between surface and said polymer,

(d) during said period pressing said fibrous web against said thermoplastic polymer on said hot surface to such an extent that portions of said thermoplastic polymer adjacent to said porous web penetrate into said fibrous web and are molded around surface fibers thereof while molten portions of said thermoplastic polymer remain exposed at the surface of said fibrous web and then

(e) within 5 seconds of said contact in step a, continuously peeling said fibrous web away from said hot roll surface so that said fibrous web removes, from said hot roll surface, said molded portions of said thermoplastic polymer and at least part of said molten exposed portions.

4,333,787

ADHESION OF RUBBER TO BRASS

David E. Erickson, Stow, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Filed May 22, 1980, Ser. No. 152,235

Int. Cl.[3] B29H *9/10;* B60C *9/00*

U.S. Cl. 156—307.3 6 Claims

1. The method which comprises treating brass plated steel cord in an acidic alcohol solution of from about 1 to 10% by weight of a carboxylic acid in an alcohol, said carboxylic acid having from 1 to 12 carbon atoms, having from 1 to 3 COOH groups and consisting of carbon, hydrogen and oxygen and said alcohol having from 1 to 10 carbon atoms, having from 1 to 2 OH groups and consisting of carbon, hydrogen and oxygen for a time and at a temperature sufficient to remove at least a substantial amount of the corrosion products on the outer surface layers of said cord, rinsing said cord and drying the same, and treating said acidic alcohol solution treated, rinsed and dried cord with H_2S gas for a time and at a temperature sufficient to provide a thin sulfide layer on the surface of said cord.

4,333,788

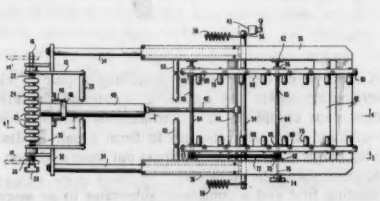
TIRE BUILDING MACHINE SERVICER

Karl W. Klose, Findlay, Ohio, assignor to Cooper Tire & Rubber Company, Findlay, Ohio

Filed Apr. 4, 1980, Ser. No. 137,556

Int. Cl.[3] B29H *17/20*

U.S. Cl. 156—405 R 10 Claims



1. An extensible servicer device for supplying belt material to a tire carcass being built, comprising, a support member having brackets secured thereto;

a pair of frame rails arranged in spaced parallel relation to one another with frame members slidably mounted on said rails, said frame members having a receiving and a delivery end;

means pivotally connecting an end of said rails to said brackets;

a cylinder and piston rod connected to said frame members for advancing said frame members toward the other end of said rails and to retract said frame members towards the first named end of said rails;

said frame members receiving said belt material for delivering same to said tire carcass; and

the delivery end of said frame members tapering to a reduced end portion having guide members mounted thereon subjacent the top surface of said frame members, said guide members supporting said belt material and precisely orienting the center of said belt material with the center of the tire carcass contemporaneous with delivering the belt material in a tangential path to the point of contact with the center line of the tire carcass.

4,333,789

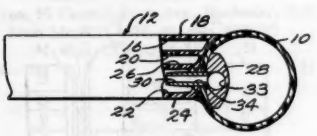
APPARATUS FOR MANIFOLDING MULTIPLE PASSAGE SOLAR PANEL

Roy E. McAlister, 5285 Red Rock North, Phoenix, Ariz. 85018

Division of Ser. No. 172,418, Jul. 25, 1980, Pat. No. 4,300,971, which is a continuation-in-part of Ser. No. 32,635, Apr. 23, 1979. This application Dec. 4, 1980, Ser. No. 213,198

Int. Cl.³ B32B *31/04, 31/26*

U.S. Cl. 156—499 **22 Claims**



1. Apparatus for sealingly connecting a thermoplastic solar panel structure having a multiplicity of elongated thin wall sections defining a multiplicity of parallel passages extending longitudinally between the ends of said panel structure to a thermoplastic manifold tube, said apparatus comprising

panel structure engaging means for fixedly positioning an end of a panel structure to which a manifold tube is to be connected,

means for mounting a manifold tube for movement from a position in which a side wall portion thereof is spaced a predetermined distance from a panel structure end fixedly positioned by said panel structure engaging means into a position of pressure engagement therewith,

an elongated mandrel having a multiplicity of transversely projecting elements corresponding in number and spacing to the panel passages to be communicated with the interior of the manifold tube of a size to engage longitudinally within the interior periphery of said manifold tube,

means mounting said mandrel for transverse movement within said manifold tube,

means for heating the panel structure end and said manifold tube side wall portion when the latter are disposed in said predetermined spaced relation to soften the thermoplastic material thereof,

means for moving said mandrel within said manifold tube so as to position the projecting elements thereof through the side wall portion thereof and into the open ends of corresponding panel structure passages and for withdrawing said mandrel in the direction of extent of said elements to a position within the interior of said manifold tube following the connection of the latter to the panel structure end, and

means for moving said manifold tube toward said panel structure end so as to cause said manifold tube side wall portion to apply a pressure to said panel structure end sufficient to deform the softened thermoplastic material thereof and effect a fusing of the same into a unitary mass.

4,333,790

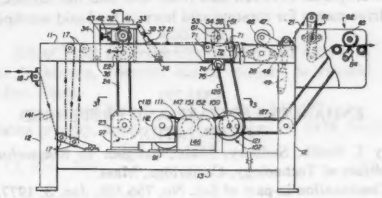
ROTARY BAG SEALING AND PERFORATING MACHINE

Helmut T. Schaffron, c/o Schaffron Machine & Engineering Co., 9 D, Harter Ave., Woodland, Calif. 95695

Filed Jul. 31, 1980, Ser. No. 174,164

Int. Cl.³ B32B *31/18;* **B31B** *1/26*

U.S. Cl. 156—510 **17 Claims**



1. In a machine for forming transverse lines across a moving web and wherein the distances between said lines may be varied, a frame, web advancing means for advancing said web longitudinally of said frame, a shaft extending transversely of said frame, line placement means rotated by said shaft for placing said transverse lines on said web during a portion of the cycle of rotation of said shaft, a motor, first means for driving said web advancing means from said motor, second means for rotating said shaft from said motor for said first portion of its cycle of rotation at a first speed having a first ratio to the speed of said first means and for a second portion of the cycle of rotation of said shaft at a second speed having a second ratio different from said first ratio, and second means for increasing and decreasing said second speed.

4,333,791

ULTRASONIC SEAM WELDING APPARATUS

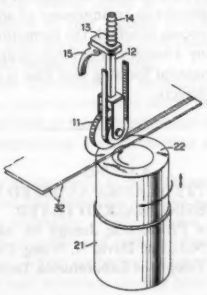
Heizo Onishi, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 14, 1980, Ser. No. 196,641

Claims priority, application Japan, Oct. 27, 1979, 54-149044[U]; May 20, 1980, 55-69056[U]

Int. Cl.³ B23K *19/04;* **B29C** *27/08*

U.S. Cl. 156—580.1 **8 Claims**



1. An ultrasonic seam welding apparatus comprising:

a machine frame provided with a plurality of supports;

a converter-horn assembly including a horn coupled to, for being oscillated in a parallel direction to a longitudinal axis of said assembly, an electroacoustic converter;

said horn having a circular flat surface substantially perpendicular to, and concentric with, said longitudinal axis;

bearing means interposed between said supports and said

assembly for enabling said assembly to rotate about said longitudinal axis;

a roller disposed rotatably on said machine frame;

said roller having a peripheral surface, which is placed opposite to said flat surface and at a position off-set from said longitudinal axis in a radial direction;

urging means for urging said roller toward said flat surface of said horn to hold two or more sheet-like thermoplastic workpieces between said roller and said flat surface; and

a drive means for rotating said horn to feed said workpieces.

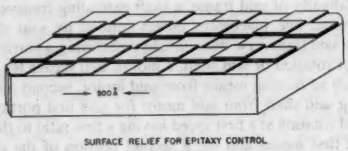
4,333,792
ENHANCING EPITAXY AND PREFERRED ORIENTATION

Henry I. Smith, Sudbury, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 756,358, Jan. 3, 1977, abandoned. This application Apr. 9, 1979, Ser. No. 28,118

Int. Cl.³ C30B *23/04*

U.S. Cl. 156—612 **38 Claims**



SURFACE RELIEF FOR EPITAXY CONTROL

1. A method of enhancing epitaxy and preferred orientation which method includes the steps of intentionally forming at predetermined locations a plurality of artificial defects having predetermined geometric form at the surface of a solid substrate, with said artificial defects being selected from the group consisting of (1) artificial point defects and (2) artificial surface relief structure,

the separation between adjacent artificial defects being sufficiently small so that both artificial defects in a pair of adjacent ones contribute to influencing said crystallographic orientation,

and thereafter depositing a film on said surface to form a substantially epitaxial or preferred orientation layer in said film having crystallographic orientation materially influenced by the geometric arrangement of adjacent artificial defects by a process in which the formation of crystalline regions and any changes in crystallographic orientation occur while material forming said film is in contact with said artificial defects.

4,333,793
HIGH-SELECTIVITY PLASMA-ASSISTED ETCHING OF RESIST-MASKED LAYER

Nadia Lifshitz, New Providence; Joseph M. Moran, Berkeley Heights, both of N.J., and David N. Wang, Cupertino, Calif., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 20, 1980, Ser. No. 199,023

Int. Cl.³ B44C *1/22; 25/06*

U.S. Cl. 156—643 **9 Claims**

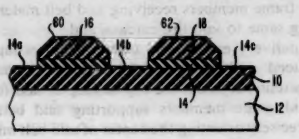
1. A method of fabricating a VLSI device, comprising the steps of

forming a layer to be patterned,

depositing a resist layer on said layer to be patterned,

patterning said resist layer to define features therein,

and, using said patterned resist layer as a mask, dry etching said layer to be patterned in a plasma-assisted etching step in which a protective polymer film is formed and maintained only on said patterned resist layer while said layer



to be patterned is etched to define said device features therein.

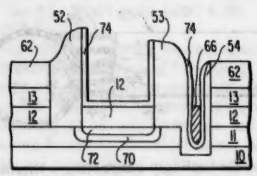
4,333,794
OMISSION OF THICK SI_3N_4 LAYERS IN ISA SCHEMES

Klaus D. Beyer, and Joseph S. Logan, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 7, 1981, Ser. No. 251,698

Int. Cl.³ H01L *21/306, 21/312*

U.S. Cl. 156—648 **10 Claims**



1. A method of forming self-aligned dielectric isolation in a semiconductor silicon substrate comprising:

(a) forming an epitaxial layer on said substrate;

(b) forming a polysilicon layer over said epitaxial layer;

(c) forming an ion implantation masking rectangular island on said polysilicon layer;

(d) forming ion implantation masking side walls on said diffusion-resistant rectangular island;

(e) implanting a first impurity into areas not covered by said island or said side walls;

(f) forming an ion implantation masking layer on said silicon substrate at areas other than at said diffusion-resistant side walls and abutting said side walls;

(g) removing said side walls;

(h) implanting a second impurity only in the area where said side walls were removed, said island and said masking layer preventing implantation into areas other than where said side walls were removed;

(i) etching a gap through said polysilicon layer at the areas where side walls were removed;

(j) covering the surface of said device with an etchable dielectric material, which etchable dielectric material also covers said exposed silicon layer;

(k) selectively masking and then removing said etchable dielectric material in areas other than in said island, said gap, and an area contiguous to said gap, whereby said etchable dielectric material is removed in a prospective deep trench area surrounding but spaced from said gap by said area contiguous said gap;

(l) etching a deep trench into said silicon substrate where said etchable dielectric material was removed from said prospective deep trench area, said deep trench being spaced from said island by said gap and said area contiguous to said gap;

(m) implanting a third impurity into said deep trench;

(n) filling said deep trench with a dielectric isolation material.

4,333,795

CHEMICAL COMPOSITIONS USEFUL AS PAPER SIZING AGENTS AND METHOD OF MAKING SAME

Peter C. Street, Langho, England, assignor to Tenneco Chemicals, Inc., Piscataway, N.J.

Filed Apr. 7, 1980, Ser. No. 137,677
Claims priority, application United Kingdom, May 23, 1979, 7918031
Int. Cl.[3] D21D *3/00*; D21H *3/28, 3/34*; C09D *3/40*
U.S. Cl. 162—168 N 23 Claims

1. A stable aqueous chemical composition which is suitable for use as a one-sheet sizing agent for paper, which comprises a rosin dispersion component, aluminum sulphate, and optionally an alkali, the pH of said composition being from about 3.0 to about 5.0.

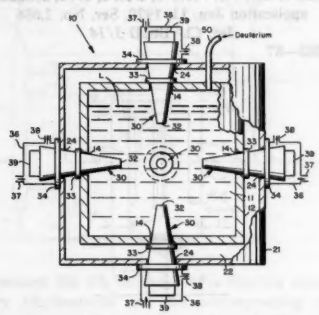
20. A method of sizing paper by a one-shot process which comprises adding the composition of claim 1 to a cellulosic, or other fibre, stock from which a web is subsequently made.

4,333,796

METHOD OF GENERATING ENERGY BY ACOUSTICALLY INDUCED CAVITATION FUSION AND REACTOR THEREFOR

Hugh G. Flynn, 55 Council Rock Ave., Rochester, N.Y. 14610

Filed May 19, 1978, Ser. No. 907,737
Int. Cl.[3] G21B *1/00*
U.S. Cl. 376—100 21 Claims



16. A cavitation fusion reactor for producing nuclear fusion neutrons and tritum, comprising

a first housing therein a chamber for holding a liquid metal at elevated temperatures and pressures,

a neutron and tritium shield surrounding said housing in spaced relation thereto,

an inert gas located in said space and surrounding said housing,

means for applying an external force in opposition to the force of gravity on the liquid metal thereby to counterbalance the force of gravity on the liquid metal so as to yield an effective gravity force of approximately zero on the liquid metal and form a cavitation zone therein, and

means for applying an acoustical pulsing field having alternating negative and positive pressure pulses to the liquid metal to vary its ambient pressure sufficiently to induce in the metal in said zone a cavitation effect which causes at least one small bubble to be formed and expand by means of said negative pressure pulse and then to collapse violently by means of a positive pressure pulse, said means for applying acoustic pulses including

a first plurality of acoustical horns mounted intermediate their ends in said housing and said shield, respectively, and extending through said space to supply acoustical energy to a liquid metal in said chamber, and

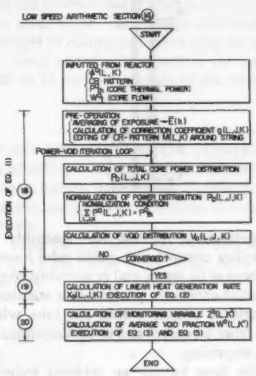
means for supplying deuterium to said chamber, thereby to provide hydrogen isotopes that are subjected to nuclear fusion by said acoustical energy.

4,333,797

REACTOR POWER CONTROL APPARATUS

Yasuo Nishizawa, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 7, 1980, Ser. No. 147,077
Claims priority, application Japan, May 11, 1979, 54-57045
Int. Cl.[3] G21C *7/00*
U.S. Cl. 376—210 3 Claims



1. A reactor power control apparatus for a nuclear reactor, comprising core flow control means for controlling a core flow within the reactor to thereby control reactor power, and arithmetic operational means for determining the linear heat generation rate in the longitudinal direction of fuel rods in the reactor from input quantities available from neutron detectors provided at predetermined locations in said reactor and producing a core flow setting signal to be supplied to said core flow control means so that change rate of said linear heat generation rate does not exceed a limit change rate, said arithmetic operational means comprising:

first means for determining a monitoring quantity represented by a ratio between the linear heat generation rate and neutron flux at monitoring points within said reactor and for determining a void fraction at said monitoring points;

second means for receiving as input thereto scheduled values of maximum and minimum electric powers expected in succeeding operation of said reactor to determine said monitoring quantities and said void fractions at said monitoring points which correspond to said maximum electric power and said minimum electric power, respectively, to thereby derive a relation among three sets of said monitoring quantities and said void fractions;

third means for determining the void fraction from the instant neutron flux and determining the linear heat generation rate from the just above-mentioned void fraction and neutron flux in accordance with said relation for every control period; and

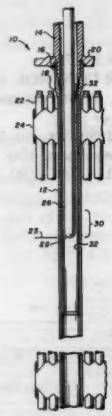
fourth means for producing said core flow setting signal on the basis of said linear heat generation rate.

4,333,798

SLEEVE CONNECTION FOR RECONSTITUTABLE CONTROL ROD GUIDE TUBE

Andrew J. Anthony, Tariffville, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 10, 1979, Ser. No. 102,171
Int. Cl.³ G21C *19/20*
U.S. Cl. 376—449 **4 Claims**



1. In a reconstitutable nuclear fuel assembly of the type including a zircaloy control rod guide tube having an internally threaded boss at its upper end removably connected to an externally threaded extension portion of a stainless steel post, and having a critical region within the tube which may be subject to wear from a control rod to be suspended therein, the improvement comprising:

the guide tube boss having an internal ledge below the threads thereof;

a flanged, thin-walled metal cylinder suspended from the ledge within the guide tube and extending downward below the critical region, the cylinder having an inner diameter larger than the control rod outer diameter and an outer surface in firm contact with the tube inner surface over substantially the entire length of the cylinder;

and the lowermost internal extension of the post being in vertical alignment with but slightly spaced form the flange, whereby the cylinder may freely expand toward the post but is restrained from moving upward into the post.

4,333,799

PURIFICATION AND RECOVERY OF ETHYLENE DICHLORIDE

Aurelio M. Crico, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 61,711, Jul. 30, 1979, abandoned. This application Dec. 15, 1980, Ser. No. 216,038
Int. Cl.³ B01D *3/40*
U.S. Cl. 203—67 **2 Claims**

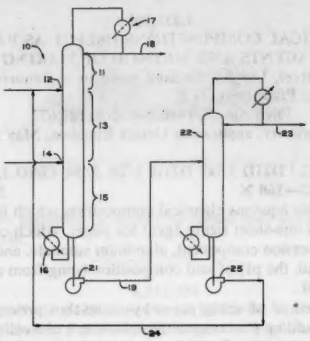
1. A process comprising:

a. vaporizing n moles per hour of crude liquid ethylene dichloride containing trichloroethylene, benzene or a mixture thereof to form vaporous crude ethylene dichloride;

b. feeding n moles per hour of said vaporous crude ethylene dichloride to a distillation column at a first feed point;

c. feeding at least 0.43 n moles per hour of liquid perchloroethylene to said column at a second feed point located on said column above said first feed point;

d. within said column, contacting vaporous crude ethylene dichloride with downflowing perchloroethylene, thereby stripping ethylene dichloride of trichloroethylene, benzene or a mixture thereof, and



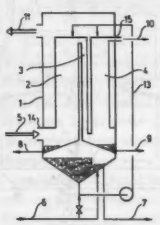
e. recovering, as a light fraction, ethylene dichloride having a reduced content of trichloroethylene, benzene or a mixture thereof.

4,333,800

METHOD FOR THE RECOVERY OF EASILY EVAPORABLE COMPONENTS FROM HOT GASES

Kaj O. Henricson, Kaskö, Finland, assignor to Rosenblad Corporation, Princeton, N.J.

Continuation of Ser. No. 746,676, Dec. 2, 1976, abandoned. This application Jan. 11, 1979, Ser. No. 2,686
Int. Cl.³ B01D *3/14*
U.S. Cl. 203—87 **2 Claims**



1. A method for the recovery of heat and easily evaporable components from methanol and turpentine-bearing vapor wherein such vapor from a single source of vapor is selectively condensed to produce two distinct and different condensates, a clean condensate and a condensate containing methanol, comprising the steps of:

(a) feeding hot liquor from cellulose digestion to an expansion tank to separate a first stream of methanol and turpentine-bearing vapor from the liquor, which vapor is said vapor from a single source of vapor;

(b) feeding said first vapor stream from a single source from step (a) to the section of a first gas space of an evaporator, expanding and feeding the liquor from step (a) to said evaporator as cooling liquor and passing said cooling liquor countercurrently to and in indirect heat exchange contact with said vapor in said first gas space to produce a clean condensate from said vapor which is relatively free of easily evaporable components while leaving some of said vapor uncondonsed;

(c) removing said clean condensate from said evaporator and passing said uncondensed vapor into a second gas space of said evaporator to flow therethrough in concurrent indirect heat exchange contact and then in countercurrent indirect heat exchange contact with said cooling liquor,

producing a second condensate from the vapor in said second gas space containing methanol and leaving uncondensed some vapor in said second gas space containing methanol and turpentine;

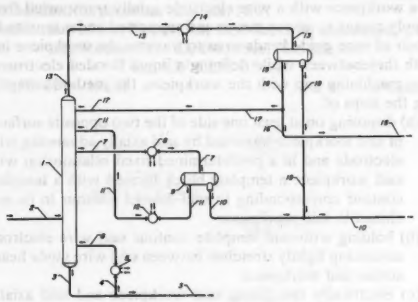
(d) discharging said condensate containing methanol from said second gas space, and withdrawing said uncondensed vapor from said second gas space to a turpentine condenser for condensation of turpentine and separation of methanol therefrom and combining said separated methanol with the condensate from said second gas space and discharging cooling liquor from the evaporator.

4,333,801

RECOVERY OF A CUMENE/ALPHA-METHYLSTYRENE FRACTION FROM A MIXTURE THEREOF WITH PHENOL AND WATER

Peter R. Pujado, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 3, 1981, Ser. No. 289,591
Int. Cl.³ B01D 3/14
U.S. Cl. 203—94 4 Claims



1. A process for the recovery of a fraction comprising a secondary alkylbenzene and the corresponding secondary monoalkenylbenzene from a mixture thereof with a phenol and water which comprises the steps of:

(a) introducing said mixture into a fractionation column at an intermediate level, said column being operated at conditions to separate an overhead fraction comprising said secondary alkylbenzene and said secondary monoalkenylbenzene, and a bottoms fraction comprising said phenol;

(b) recovering one portion of said overhead fraction, and returning another portion thereof as reflux to said column;

(c) withdrawing a vapor stream from a level in said column above the aforementioned intermediate level and below the withdrawl point of said overhead fraction, said vapor stream comprising at least a portion of said secondary alkylbenzene and said secondary alkenylbenzene and an azeotropic mixture of said phenol and water;

(d) condensing said vapor stream and forming an organic phase and an aqueous phase; and,

(e) discharging said aqueous phase, and recycling said organic phase to said column at a level above that at which said vapor stream is withdrawn and below that at which said secondary alkylbenzene/secondary alkenylbenzene fraction is returned to said column as reflux, said organic phase being recycled to said column at conditions to maintain the vapor phase conditions therein.

4,333,802

METHOD OF ELECTROCHEMICAL OBTAINING OF BRIGHT TIN COATINGS

Jan Przyluski; Kazimierz Madry; Zbigniew Dolecki; Andrzej Kotarski; Maria Drygas; Jacek Kokosinski; Zygmunt Kuzma, and Bohdan Chelminski, all of Warsaw, Poland, assignors to Politechnika Warszawska, Warsaw, Poland

Continuation-in-part of Ser. No. 109,581, Jan. 4, 1980, abandoned. This application Jan. 22, 1981, Ser. No. 227,306
Claims priority, application Poland, Jan. 11, 1979, 212740
Int. Cl.³ C25D 3/32
U.S. Cl. 204—54 R 1 Claim

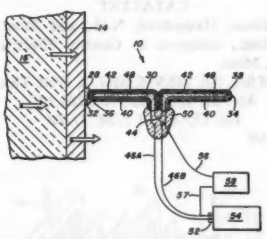
1. In a method for the electrodeposition of bright tin coatings by the use of an electroplating bath comprising a solution of stannous sulfate and sulfuric acid, the improvement which comprises adding to the bath an alcoholic solution containing from 14 to 30 percent by weight of a surface active agent, from 0.5 to 5 percent by weight of an unsaturated carbonyl compound containing an aryl group, from 1.0 to 10.0 percent by weight of the product of transesterification of a natural fat, and at least one of the following ingredients: from 0 to 8 percent by weight of an ester of an unsaturated acid and from 0 to 15 percent by weight of compound containing an ether group, the said solution being added to the bath in the ratio of 1 part of solution to 20 to 35 parts by weight of the bath.

4,333,803

METHOD AND APPARATUS FOR CONTROLLING THE HEAT BALANCE IN ALUMINUM REDUCTION CELLS

Edward J. Seger, Apollo, and Warren E. Haupin, New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 3, 1980, Ser. No. 193,597
Int. Cl.³ C25C 3/00, 3/06, 3/20; G01F 15/02
U.S. Cl. 204—67 19 Claims



18. In a method of controlling the energy balance and lateral ledge thickness of electrolyte in an aluminum reduction cell including molten aluminum and electrolytic bath, the method comprising:

(a) attaching a relatively short and thin heat flow sensor at a location on the outside surface of a cell wall with said sensor having a negligible effect on the heat flow from the surface to which it is attached;

(b) said sensor having a close-ended hollow thermally conductive body, a first and a second thermocouple therein each near opposite ends of the body, each thermocouple having two wires of dissimilar metals, each thermocouple having the same dissimilar metals, and insulation within the body for electrically insulating the wires from the body, said sensor attached substantially perpendicular to the cell side wall by one closed end of the sensor body at a location below the minimum molten aluminum and electrolytic bath interface;

(c) electrically connecting one of said wires of the first thermocouple with the wire of the same metal of the second thermocouple at a location intermediate the closed ends of the sensor body;

(d) electrically connecting the other of the two wires of the first and second thermocouple with an instrument respon-

sive to the electrical potential between the first and second thermocouples, said wires extending out of the sensor body at a location intermediate the closed ends of the body;

(e) measuring an electrical signal generated by the temperature difference between the first and second thermocouples, the signal being a function only of the cell wall surface and heat flux from the surface;

(f) determining the heat flow through the cell wall as a function of the temperature difference; and

(g) maintaining a predetermined energy balance commensurate with a stable reduction cell by adjusting the amount of heat added to the cell to control the lateral ledge thickness of electrolyte.

4,333,804
METHOD OF PREVENTING DETERIORATION OF PALLADIUM OXIDE ANODE

Kohji Saito, and Hidenori Shibata, both of Chiba, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

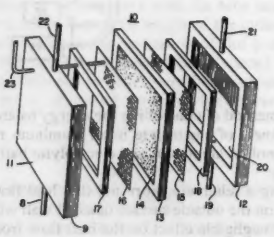
Filed Jan. 21, 1981, Ser. No. 226,903
Claims priority, application Japan, Jan. 22, 1980, 55/5231
Int. Cl.³ C25B *1/34*
U.S. Cl. 204—98 **9 Claims**

1. The method of preventing deterioration of a palladium oxide type anode in the anolyte of a diaphragm type electrolytic cell for electrolysis of an alkali metal chloride comprising adding to said anolyte a compound generating hypochlorite ion during shortcircuit state, the concentration of said hypochlorite ion being higher than 1.0 g./l., whereby the concentration of hypochlorite ion in the anolyte yields an anode potential higher than the reduction potential of palladium oxide.

4,333,805
HALOGEN EVOLUTION WITH IMPROVED ANODE CATALYST

Craig R. Davidson, Hampstead, N.H., and John M. Sedlak, Andover, Mass., assignors to General Electric Company, Wilmington, Mass.

Continuation of Ser. No. 145,936, Mar. 2, 1980. This application Apr. 27, 1981, Ser. No. 258,127
Int. Cl.³ C25B *1/34, 11/08*
U.S. Cl. 204—98 **21 Claims**



1. In a method for electrolytically generating halogens comprising:

(a) providing a catalytic cathode;

(b) providing a catalytic halogen evolving anode;

(c) positioning a solid polymer electrolyte ion transporting membrane between the cathode and the anode, the cathode being bonded to one surface of the membrane and the anode being bonded to the other surface of the membrane, and,

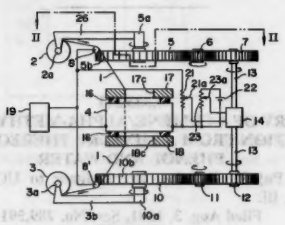
(d) providing a direct potential between the cathode and the anode and supplying a halogen-containing electrolyte to one of the electrodes to be acted on electrochemically to evolve halogen gas at the anode;

the improvement comprising providing a catalyst at the halogen evolving anode comprising ruthenium oxide and manganese oxide.

4,333,806
METHOD OF AND APPARATUS FOR ELECTROEROSIVELY MACHINING A CONTOUR IN A WORKPIECE WITH A TRAVELING-WIRE ELECTRODE

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Aug. 29, 1980, Ser. No. 182,648
Claims priority, application Japan, Aug. 30, 1979, 54-110551
Int. Cl.³ B23P *1/02, 1/12*
U.S. Cl. 204—129.1 **19 Claims**



1. A method of electroerosively machining a desired contour in a workpiece with a wire electrode axially transported from supply means to takeup means and supported under tension by a pair of wire guide heads so as to traverse the workpiece in a path therebetween while defining a liquid flooded electroerosive machining gap with the workpiece, the method comprising the steps of:

(a) disposing on at least one side of the two opposite surfaces of said workpiece traversed by said axially advancing wire electrode and in a predetermined fixed relationship with said workpiece a template block formed with a template contour corresponding to said desired contour to be machined in said workpiece;

(b) holding with said template contour said wire electrode advancing tightly stretched between said wire guide heads across said workpiece;

(c) electrically energizing said workpiece and said axially advancing wire electrode to electroerosively remove material from said workpiece across said machining gap; and

(d) while holding with said template contour said wire electrode advancing tightly stretched between said wire guide heads across said workpiece, displacing at least one of said guide heads to cause said axially advancing wire electrode to move transversely to the axis thereof along said template contour so that with the transverse movement of said wire electrode, said desired contour is progressively formed in said workpiece by electroerosion.

4,333,807
REVERSE COATING PROCESS

Tameyuki Suzuki, Zushi, and Akira Kubo, Sakura, both of Japan, assignors to Shinto Paint Co., Ltd., Amagasaki, Japan

Filed Oct. 1, 1980, Ser. No. 192,839
Claims priority, application Japan, Oct. 12, 1979, 54-132257
Int. Cl.³ C25D *13/06, 13/20*
U.S. Cl. 204—181 T **3 Claims**

1. In a reverse coating process comprising coating a substrate with a coating composition containing a fine synthetic resin powder which is solid at a room temperature but can be melted at an elevated temperature, heating the thus-obtained coating, electrodeposition coating the first coating with an ionic coating composition and subsequently heating the same, the improvement wherein the heating step following the first coating of the substrate with said resin powder-containing

coating composition is carried out at a temperature which is high enough to completely melt the thus-formed coating but not so high to effect cross-linking curing of said coating, and wherein the coating, after the said heating or the electrodeposition coating step, is subjected to sanding, and the last heating step is carried out at a temperature which is high enough to effect a cross-linking cure reaction in the coating.

4,333,808

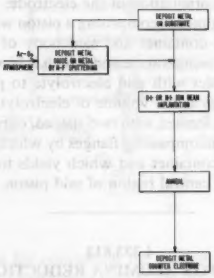
METHOD FOR MANUFACTURE OF ULTRA-THIN FILM CAPACITOR

Arup Bhattacharyya, Essex Junction, Vt.; Wei-Kan Chu, Poughkeepsie; James K. Howard, Fishkill, both of N.Y., and Francis W. Wiedman, Stowe, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 89,710, Oct. 30, 1979, abandoned. This application Feb. 13, 1981, Ser. No. 234,084

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 D **6 Claims**



1. A method for manufacture of an ultra-thin film capacitor comprising:

providing a substrate,

applying to said substrate a metal electrically conductive film to form a composite having a first capacitor electrode,

applying by sputtering a film selected from the group consisting of metal oxide films and metal nitride films to the surface of said first electrode;

the metal of said metal oxide and metal nitride films is selected from the group consisting of tantalum, niobium, titanium, vanadium, hafnium and zirconium;

subjecting the surface of said metal oxide and metal nitride films to ion implantation treatment to implant ions selected from the group consisting of O+ and N+ ions in the surface of said first electrode;

subjecting said composite to annealing heat treatment to provide an ultra-thin dielectric film adjacent the surface of said first electrode; and

applying an electrically conductive film to said composite to form a counter capacitor electrode.

4,333,809

CROSS-LINKABLE POLYCARBONATE ELASTOMERS, A PROCESS FOR THEIR PREPARATION AND USE FOR PACKAGING MEDICINES

Manfred Schreckenberg; Dieter Freitag, both of Krefeld; Hans-Heribert Burgdörfer, Cologne, all of Fed. Rep. of Germany; Günther Lehnert, Emeryville, Calif.; Siegfried Adelmann, and Hans Rudolph, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 22, 1980, Ser. No. 170,439

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1979, 2930787

Int. Cl.³ C08G *63/62*; C08J *3/28*

U.S. Cl. 204—159.14 **14 Claims**

1. In the process for the preparation of high molecular weight, thermoplastically processable, segmented, cross-linkable polycarbonate elastomers by known polycarbonate preparation processes, in a heterogeneous or a homogeneous solvent phase system, from "soft segments" which are capable of incorporation and from diphenols, the improvement comprising cocondensing aromatic hydroxyketones having the carbonyl and the hydroxyl groups bonded directly to an aromatic ring in amounts of 1 to 20 mol % relative to the molar amount of said diphenols.

4,333,810

ANALYZER FOR CHEMICAL OXIDIZING OR REDUCING AGENTS

Duane K. Wolcott, and John B. Carraway, Jr., both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

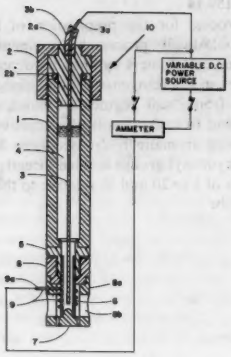
Filed Apr. 11, 1980, Ser. No. 139,379

Int. Cl.³ G01N *27/30, 27/52*

U.S. Cl. 204—195 M **27 Claims**

1. An instrument for quantitatively determining the concentration of chemical oxidizing and reducing agents in a gaseous environment, comprising: a first electrode exposed to said gaseous environment; a second electrode; an electrolyte solution; an ion-exchange membrane adapted to contain said electrolyte solution; and means for measuring a flow of electrical current generated between said first and second electrodes, said second electrode in contact with said electrolyte solution, said ion-exchange membrane separating said electrolyte solu-

tion and second electrode from said first electrode, said first electrode in electrical contact with said ion-exchange membrane thereby completing an electrochemical couple between said first and second electrodes.



4,333,811

DEVICE FOR MONITORING A COMPONENT IN A FLUID MIXTURE

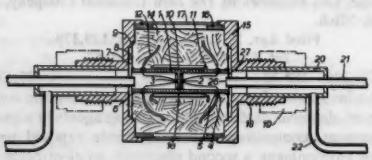
Riad M. A. Kocache, and Danny F. Holman, both of Crowborough, England, assignors to Sybron Corporation, Rochester, N.Y.

Filed Jun. 20, 1980, Ser. No. 161,449

Claims priority, application United Kingdom, Jun. 21, 1979, 7921718

Int. Cl.³ G01N *27/58*

U.S. Cl. 204—195 S **11 Claims**



1. A device for monitoring a component in a fluid mixture comprising a tube, the bore of which is divided into two chambers by a disc of solid electrolyte having a conducting ion related to the component to be monitored, the disc being provided with electrodes on its opposed faces, the device further comprising a housing within which said tube is disposed, and suspension means for resiliently suspending said tube within said housing.

4,333,812

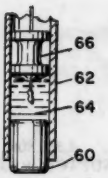
ORIENTATION-INSENSITIVE ELECTRODE

Gary L. Bukamier, 4358 E. La Palma, Anaheim, Calif. 92807, and Steven L. Rupert, 600 Langsdorf Dr., Fullerton, Calif. 92631

Filed Jun. 27, 1980, Ser. No. 163,710

Int. Cl.³ G01N *27/30, 27/36*

U.S. Cl. 204—195 G **9 Claims**



1. An electrode comprising:

a container for electrolyte including a wall at which electrochemical sensing is to be accomplished;

a body of electrolyte disposed in said container overlying said wall;

maintaining means for maintaining said electrolyte in intimate contact with said wall against gravitational force in every spacial orientation of the electrode;

said maintaining means comprising a piston which is trapped between said container and said body of electrolyte to increase with temperature and which is biased to maintain intimate contact with said electrolyte to prevent formation of bubbles as the volume of electrolyte is decreased;

the piston being formed with two spaced, outwardly extending resilient encompassing flanges by which it engages the walls of the container and which yields to permit piston action by the central region of said piston.

4,333,813

CATHODES FOR ALUMINA REDUCTION CELLS

Howard I. Kaplan, Florence, Ala.; Jerry H. Bryce, Lawrenceburg, Tenn.; Thomas J. Johnston, Rogersville, Ala.; Curtis J. McMinn, Florence, Ala.; John T. Willett, Florence, Ala., and Nolan E. Richards, Florence, Ala., assignors to Reynolds Metals Company, Richmond, Va.

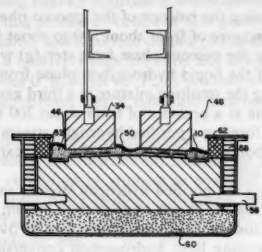
Continuation-in-part of Ser. No. 126,837, Mar. 3, 1980, abandoned, which is a continuation of Ser. No. 43,241, May 29, 1979, abandoned, which is a continuation of Ser. No. 43,338, May 29, 1979, abandoned. This application Nov. 5, 1980, Ser. No. 203,559

Int. Cl.³ C25C *3/08;* B32B *9/04;* B05D *5/12*

U.S. Cl. 204—243 R **29 Claims**

11. An alumina reduction cell having a drained cathode which comprises a carbonaceous bed and a composite tile, said composite tile being characterized by a layer of an RHM material bonded to a base layer of a graphitic material, said RHM material comprising a hot pressed mixture of titanium diboride and aluminum nitride powders, said composite tile being further characterized by the bond between said layer of an RHM material and said base layer of a graphitic material, said bond having been produced simultaneously as said layer of an RHM material is formed by hot pressing said mixture of said powders directly against said base layer of a graphitic material,

said base layer of a graphitic material being bonded to said carbonaceous bed by means of a carbonaceous cement, said



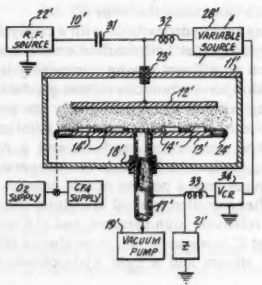
layer of an RHM material thereby providing a molten aluminum contacting surface of said cathode.

4,333,814

METHODS AND APPARATUS FOR IMPROVING AN RF EXCITED REACTIVE GAS PLASMA

Birol Küyel, Hopewell, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 26, 1979, Ser. No. 107,223
Int. Cl.³ C23F 1/02
U.S. Cl. 204—298 **2 Claims**



1. Apparatus for controlling the plasma etching of at least one surface of a workpiece which comprises:

a hermetically-sealed reaction chamber;

first and second, spaced-apart, electrodes positioned within said chamber, said workpiece being supported by at least said second electrode for exposure to the plasma;

means for supplying at least one gas species to said reaction chamber;

means for maintaining a predetermined level of vacuum within said chamber, said means also serving to exhaust spend gases and reaction by-products from the chamber;

a source of RF energy for establishing an alternating field between said first and second electrodes thereby to excite said gas species to form an RF reactive gas plasma;

a DC blocking capacitor intermediate the output of said source of RF energy and said first electrode;

a variable source of DC potential;

an RF-choke interconnecting a first output terminal of said variable source of DC potential and said first electrode;

a voltage-controlled-resistor having a control electrode connected intermediate a second output terminal of said variable DC source and ground; and

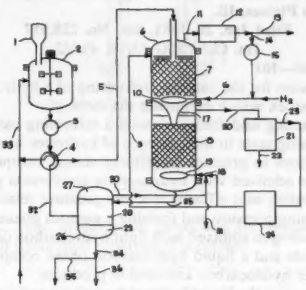
an RF-choke interconnecting the control electrode of said voltage-controlled-resistor and said second electrode.

4,333,815

COAL LIQUEFACTION IN AN INORGANIC-ORGANIC MEDIUM

Theodore Vermeulen, Berkeley; Edward A. Grens, II, Danville, and Ronald R. Holten, El Cerrito, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 5, 1979, Ser. No. 17,299
Int. Cl.³ C10G 1/06, 1/08
U.S. Cl. 208—10 **14 Claims**



1. An improved process for the liquefaction of coal by contacting pulverized coal in the presence of hydrogen at a temperature in the range of about 225° C. to below 315° C. and a pressure of at least 200 p.s.i.g. with a liquid mixture having an inorganic phase and an organic phase, wherein:

(1) said inorganic phase consists essentially of $ZnCl_2$ catalyst melt and optionally water, and wherein

(2) said organic phase comprises at least one organic solvent selected from the group consisting of (a) and (b) wherein

(a) is an organic solvent miscible with $ZnCl_2$ catalyst characterized as being soluble in the organic phase and as reducing the melting point of $ZnCl_2$ catalyst, said organic solvent being selected from the group consisting of methanol, ethanol, propanol, isopropanol, and a mixture thereof, and

(b) is a hydrogen-donor solvent comprising hydroaromatic hydrocarbons immiscible with the $ZnCl_2$ catalyst, with the provision that the inorganic phase must contain water when a member of (2a) is not selected as a constituent of the organic phase.

11. An improved process for the liquefaction of coal by contacting pulverized coal in the presence of hydrogen at a temperature in the range of about 225° C. to below 315° C. and a pressure of at least 200 p.s.i.g. with a liquid mixture having an inorganic phase and an organic phase, wherein:

(1) said inorganic phase consists essentially of $ZnCl_2$ catalyst melt and optionally water, and wherein

(2) said organic phase comprises methanol.

4,333,816

METHOD FOR THE PRODUCTION OF NEEDLE COKE

Georg Kölling, Essen; Ingo Romey, Drevenack, and Hellmut Kokot, Essen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Aug. 18, 1980, Ser. No. 179,281
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1980, 3006694
Int. Cl.³ C10G 9/14
U.S. Cl. 208—91 **5 Claims**

1. A method for production of needle coke, comprising the steps of liquifyng coal tar pitch at temperatures from aboout 135° C. to 280° C.; filtering the liquified coal tar pitch through a sieve having apertures from about 100 to 220 μm and a closed surface of at least 75 percent of the total sieve surface, under pressures from about 2 to 10 bar, until a filter cake of a height

of from about 40 to 80 mm forms above the sieve for separating ash, soot and quinoline-insoluble parts from the liquid; and subjecting the filtrate obtained to a coking process.

4,333,817

SEPARATION OF NORMALLY GASEOUS HYDROCARBONS FROM A CATALYTIC REFORMING EFFLUENT AND RECOVERY OF PURIFIED HYDROGEN

Dennis E. O'Brien, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jan. 26, 1981, Ser. No. 228,517
Int. Cl.³ C10G *47/00, 49/22*
U.S. Cl. 208—101 **5 Claims**

1. A process for the catalytic reforming of a hydrocarbonaceous feedstock which comprises the steps of:
(a) contacting said feedstock with a reforming catalyst in a reforming zone in the presence of hydrogen at reforming conditions to produce an effluent stream comprising hydrogen admixed with hydrocarbon conversion products;
(b) separating said effluent at a low pressure relative to the reforming pressure and forming a gaseous phase comprising hydrogen admixed with light hydrocarbon conversion products and a liquid hydrocarbon phase comprising the heavier hydrocarbon conversion products;
(c) recovering the liquid hydrocarbon phase and introducing the same into a plural stage absorption zone as the hereinafter specified lean oil;
(d) recycling a portion of said gaseous phase to the reforming zone as at least a portion of the hydrogen contained therein;
(e) contacting the balance of said gaseous phase with the heretofore specified lean oil in said plural stage absorption zone at a high pressure relative to the reforming pressure and at a temperature of from about 90° to about 150° F. to produce a purified hydrogen stream and a light hydrocarbon-enriched lean oil stream;
(f) recovering the purified hydrogen stream; and,
(g) introducing the light hydrocarbon-enriched lean oil stream into a fractionation zone at conditions to produce an overhead fraction comprising said light hydrocarbon conversion products, and a higher boiling reformate fraction comprising said heavier hydrocarbon conversion products.

4,333,818

SEPARATION OF NORMALLY GASEOUS HYDROCARBONS FROM A CATALYTIC REFORMING EFFLUENT AND RECOVERY OF PURIFIED HYDROGEN

Angelo C. Coste, Chicago, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jan. 26, 1981, Ser. No. 228,516
Int. Cl.³ C10G *47/00, 49/22*
U.S. Cl. 208—101 **7 Claims**

1. A process for the catalytic reforming of a hydrocarbonaceous feedstock which comprises the steps of:
(a) contacting said feedstock with a reforming catalyst in a reforming zone in the presence of hydrogen at reforming conditions to produce an effluent stream comprising hydrogen admixed with hydrocarbon conversion products;
(b) separating said effluent in a first gas-liquid separation zone at a low pressure relative to said reforming zone and forming a gaseous phase comprising hydrogen admixed with light hydrocarbon conversion products and a liquid hydrocarbon phase comprising the heavier hydrocarbon conversion products;
(c) compressing the gaseous phase from step (b) to a high pressure relative to said first gas-liquid separation zone;
(d) admixing the gaseous phase from step (c) with at least a portion of the liquid hydrocarbon phase from step (b);
(e) separating the resulting mixture in a second gas-liquid separation zone at said relatively high pressure and forming a gaseous phase comprising relatively pure hydrogen and a liquid hydrocarbon phase;
(f) recycling a portion of the gaseous phase from step (e) to said reforming zone;
(g) compressing the balance of the gaseous phase from step (e) to a pressure of from about 300 to about 800 psig.;
(h) admixing the gaseous phase from step (g) with at least a portion of the liquid hydrocarbon phase from step (e);
(i) separating the resulting mixture in a third gas-liquid separation zone at a pressure of from about 300 to about 800 psig. and forming a purified hydrogen stream and a liquid hydrocarbon stream comprising the hydrocarbon conversion products;
(j) recovering the purified hydrogen stream; and,
(k) introducing the liquid hydrocarbon stream into a fractionation zone at conditions to produce an overhead fraction comprising light hydrocarbon conversion products and a higher boiling reformate fraction comprising the heavier hydrocarbon conversion products.

4,333,819

SEPARATION AND RECOVERY OF HYDROGEN AND NORMALLY GASEOUS HYDROCARBONS FROM NET EXCESS HYDROGEN FROM A CATALYTIC REFORMING PROCESS

Clifford A. Scheifele, Jr., Glendale Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jan. 26, 1981, Ser. No. 228,518
Int. Cl.³ C10G *47/00, 49/22*
U.S. Cl. 208—101 **7 Claims**

1. A process for converting hydrocarbons in the presence of hydrogen which comprises the steps of:
(a) contacting said hydrocarbons with a catalyst in the presence of hydrogen at hydrocarbon conversion conditions to produce an effluent stream comprising hydrogen admixed with hydrocarbon conversion products;
(b) separating said effluent at a relatively low pressure into a gaseous stream comprising hydrogen admixed with light hydrocarbon conversion products and a liquid stream comprising the heavier hydrocarbon conversion products;
(c) contacting at least a portion of said gaseous stream with a hereinafter specified lean oil in a plural stage absorption zone at a relatively high pressure, and at a temperature of from about 0° to about 55° F., to produce a relatively pure hydrogen stream and a light hydrocarbon-enriched oil stream;
(d) recovering the relatively pure hydrogen stream;
(e) introducing the enriched oil stream into a fractionation zone at conditions to produce an overhead fraction comprising said light hydrocarbon conversion products, and a fraction comprising the heavier hydrocarbon conversion products; and,
(f) combining the liquid hydrocarbon stream from step (b) with a portion of the heavier hydrocarbon fraction from step (e) and passing the combination into said plural stage absorption zone as said specified lean oil.

4,333,820

RECOVERY OF NORMALLY GASEOUS HYDROCARBONS FROM NET EXCESS HYDROGEN IN A CATALYTIC REFORMING PROCESS

Clifford A. Scheifele, Jr., Glendale Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jan. 26, 1981, Ser. No. 228,519
Int. Cl.³ C10G *47/00, 49/22*
U.S. Cl. 208—101 **7 Claims**

1. A process for converting hydrocarbons in the presence of hydrogen which comprises the steps of:
(a) contacting said hydrocarbons with a catalyst in the presence of hydrogen at hydrocarbon conversion conditions to produce an effluent stream comprising hydrogen admixed with hydrocarbon conversion products;

(b) separating said effluent at a relatively low pressure into a gaseous stream comprising hydrogen admixed with light hydrocarbon conversion products, and a liquid stream comprising heavier hydrocarbon conversion products;
(c) contacting at least a portion of said gaseous stream with a hereinafter specified lean oil in a plural stage absorption zone at a relatively high pressure, and at a temperature of from about 0° to about 60° F., to produce a relatively pure hydrogen stream and a light hydrocarbon-enriched oil stream;
(d) recovering the hydrogen stream;
(e) introducing the enriched oil stream into a fractionation zone at conditions to produce an overhead fraction comprising light hydrocarbon conversion products, and a lower fraction comprising heavier hydrocarbon conversion products; and,
(f) passing the liquid hydrocarbon stream from step (b) into said plural stage absorption zone as said specified lean oil.

4,333,821

PROCESS FOR USE OF A HIGH OCTANE FCC CATALYSTS

Hosheng Tu, Shorewood, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 147,980, May 8, 1980, Pat. No. 4,299,733. This application Jun. 1, 1981, Ser. No. 268,620
Int. Cl.³ C10G *11/05, 11/04*
U.S. Cl. 208—120 **12 Claims**

1. A process for cracking a hydrocarbon charge stock which comprises contacting said charge stock with a catalytic composite comprising particles of the oxide of at least one of the elements from the group consisting of silicon, aluminum and titanium, said composite manufactured by:
(a) preparing a gelation product by mixing together in an aqueous medium a water soluble inorganic salt of said element and a water soluble cationic organic polymer comprising a cationic polyacrylamide having a molecular weight greater than 500,000; and,
(b) spray drying said gelation product in air at a temperature sufficient to decompose said organic polymer and to form said oxide.

2. The process of claim 1 further characterized in that said composite contains a zeolitic crystalline aluminosilicate incorporated therein by dispersing said crystalline aluminosilicate in water to prepare a slurry and adding said slurry to said gelation product prior to said spray drying.

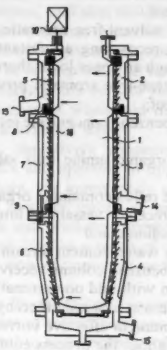
4,333,822

METHOD OF TREATING WASTE ENGINE OILS

Alexander Tkac, and Jan Cvengros, both of Bratislava, Czechoslovakia, assignors to Slovenska vysoka skola technicka, Bratislava, Czechoslovakia

Filed Nov. 10, 1980, Ser. No. 205,269
Claims priority, application Czechoslovakia, Nov. 10, 1979, 7666-79
Int. Cl.³ C10M *11/00*
U.S. Cl. 208—184 **2 Claims**

1. A method of treating waste engine oils before the re-refining thereof after the removal of water and easily volatile components therefrom, comprising heating waste engine oil under a pressure ranging from 1 to 100 Pa in the form of a thin scraped film having a thickness of from 0.1 to 2 mm to a temperature of from 200° to 300° C., condensing liberated vapors together with tornoff micro-drops at a temperature of from 20°



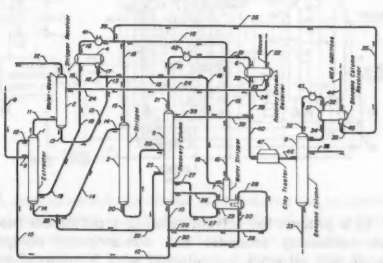
to 100° C., and immediately subjecting the condensate to a short-path distillation whereby it is refined.

4,333,823

CORROSION INHIBITION IN AROMATIC LIQUID EXTRACTION

George R. Winter, III, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sep. 8, 1980, Ser. No. 185,102
Int. Cl.³ C10G *21/22*
U.S. Cl. 208—325 **6 Claims**



1. A process for the recovery of aromatic hydrocarbons from a mixture thereof with non-aromatic hydrocarbons while reducing corrosion of process equipment, which process comprises the steps of:
a. introducing said mixture into an extraction zone, and therein contacting said mixture with a solvent comprising a sulfolane type organic compound characteristically selective for absorbing aromatic hydrocarbons;
b. removing a non-aromatic raffinate stream from said zone, through an upper locus thereof;
c. removing an aromatic, solvent-rich extract stream from said zone, through a lower locus thereof, and introducing said extract stream into a stripper column;
d. removing a non-aromatic concentrate from said stripper column, through an upper locus thereof, and removing a solvent-rich aromatic concentrate from said stripper column, through a lower locus thereof;
e. combining said non-aromatic concentrate with a hereafter described high water content stream containing organic amine and introducing the combination into a stripper receiver vessel, removing non-aromatic concentrate containing organic amine from said stripper receiver vessel and passing said non-aromatic concentrate containing organic amine as reflux into said extraction zone;
f. introducing said aromatic concentrate into a recovery col-

umn, recovering a substantially solvent-free aromatic concentrate through an upper locus thereof, and removing a substantially hydrocarbon-free solvent-rich stream from a lower locus thereof;

g. introducing said solvent-free aromatic concentrate into a benzene column, recovering a substantially pure benzene concentrate through an upper locus thereof, and removing a substantially benzene-free aromatic product stream from a lower locus thereof;

h. introducing said benzene concentrate into a benzene column receiver vessel;

i. introducing an organic amine into said benzene column receiver vessel;

j. removing benzene reflux containing organic amine from said benzene column receiver vessel and introducing said reflux to said benzene column; and

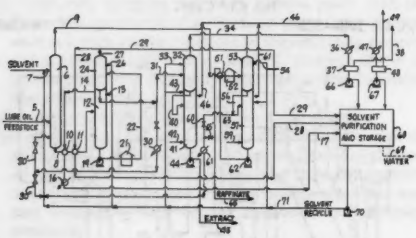
k. removing a high water content stream containing organic amine from said benzene column receiver vessel, and combining said stream with said non-aromatic concentrate from said stripper column as aforesaid thereby effecting introduction of organic amine in effective corrosion inhibiting concentrations throughout the process equipment.

4,333,824

REFINING HIGHLY AROMATIC LUBE OIL STOCKS

William F. Brown, Port Arthur, and Albert G. Bieber, China, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 27, 1980, Ser. No. 163,571
Int. Cl.³ C10G *21/20*
U.S. Cl. 208—326 **7 Claims**



1. In a process for solvent refining a petroleum based oil stock containing aromatic and non-aromatic components wherein said oil stock is contacted with N-methyl-2-pyrrolidone in a solvent extraction zone to produce an aromatics-rich primary extract phase containing solvent and an aromatics poor raffinate phase containing solvent, said phases are separated from one another and separately processed for the recovery of solvent therefrom for recycle to the process, the improvement which comprises returning a portion of said aromatics-rich extract to said solvent extraction zone in admixture with said recycle solvent.

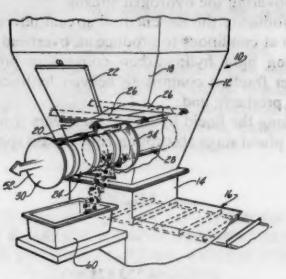
4,333,825

DUMP PIT MAGNET ASSEMBLY

Donald J. Wyland, Brighton, and Michael W. Stowe, Pontiac, both of Mich., assignors to Industrial Magnetics, Inc., Troy, Mich.

Filed Jan. 28, 1981, Ser. No. 229,297
Int. Cl.³ B03C *1/14*
U.S. Cl. 209—223 A **5 Claims**

1. In combination a hopper into the upper end of which grain is adapted to be admitted in a vertically downward direction, said hopper having an open lower end through which the grain flowing downwardly through the hopper is adapted to be discharged, said hopper having side walls extending vertically between its upper and lower ends, a plurality of magnets secured together to form a magnet cylinder in said hopper arranged with its axis extending horizontally, a support bar extending axially of said magnet cylinder and projecting radially upwardly from the uppermost surface thereof, the lower edge of said support bar being fixedly secured to said magnet cylinder, means fixed to the upper edge of said support bar and connected with side walls of said hopper for supporting the magnet cylinder in fixed position within the hopper intermediate the upper and lower ends thereof, a cylindrical stripper shell of non-magnetic material telescopically received over said magnet cylinder, said shell having an axially extending slot therein extending to at least one end of the shell for accommo-



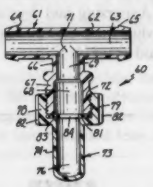
dating said support bar, a radially outwardly extending abutment extending around said one end of said shell to the opposite sides of said slot, said shell having a diameter at least slightly larger than the diameter of the magnet cylinder so as to be slideably supported thereon, one side wall of the hopper having an opening therein aligned axially with said shell and through which the shell is adapted to be axially withdrawn, a panel for optionally closing said opening, said shell being arranged on said magnet cylinder with the end thereof provided with said radial abutment remote from the end of the magnet cylinder adjacent the opening in the hopper.

4,333,826

SEDIMENT INDICATOR FOR LIQUID CIRCULATORY SYSTEM

Robert V. Albertson, 2100 Shadywood Rd., Wayzata, Minn. 55391

Continuation-in-part of Ser. No. 34,267, Apr. 30, 1979, Pat. No. 4,271,016. This application Dec. 11, 1980, Ser. No. 215,393
Int. Cl.³ B01D *21/00*
U.S. Cl. 210—94 **10 Claims**



1. A sediment indicator to provide visual indicia of the amount of sediment contained in the fluid medium of a fluid circulatory system having a fluid flow line, comprising: an open ended tubular member insertable in a fluid flow line of a fluid circulating system, said tubular member having an unobstructed fluid flow passage disposed in a normal circulatory flow path of fluid in the circulatory system when the tubular member is inserted in said fluid flow line, said unobstructed fluid flow passage having a diameter substantially the same as said fluid flow line so as to minimize disruption of normal fluid flow in the flow line, a neck extended normally from said tubular member, said neck terminating in a head having an outward edge surrounding an open end, said neck and head

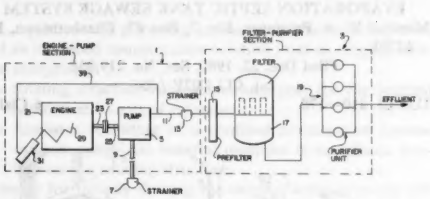
having an unobstructed passage open to said fluid flow passage and the open end of the head, a housing connected to the head and having a sediment depository chamber open to the fluid flow passage of the tubular member such that at least some sediment in fluid circulating through the fluid flow passage enters the sediment chamber; said housing having a side wall at least partially transparent to permit viewing into the sediment chamber from without the housing to determine the amount of sediment collected in the sediment chamber, said housing having a generally cylindrical body portion and a cap at one end, said head having exterior threads, said cap having an opening with interior threads threadably engaging the exterior threads on the head, said head and said housing having openings co-extensive to form a passage to said sediment chamber, said cap includes an interior shoulder which intercepts the outward edge of said head when threadably engaged with respect thereto, and a resilient washer disposed between the shoulder of the cap of the housing and the outward edge of the head to provide a fluid seal between the shoulder and outward edge, said washer having a single hole smaller than said openings in said head and housing to control the rate of collection of sediment in the sediment chamber.

4,333,827

AUTOMATIC ENGINE SHUT DOWN DEVICE AND SYSTEMS EMPLOYING THE SAME

Charles A. Cummins, II, Lutherville, Md., assignor to APT Inc., Annapolis Junction, Md.

Filed Aug. 14, 1980, Ser. No. 178,109
Int. Cl.³ B01D *1/00*
U.S. Cl. 210—100 **30 Claims**



1. A compact, portable water purification system for producing potable drinking water from contaminated or turbid water, said system comprising:

pump means having a suction inlet and a pressure discharge for withdrawing contaminated or turbid water from a source thereof and for discharging said water at an operational pressure;

strainer means for receiving said water from said pump means and for straining said water;

prefilter means for receiving said water from said strainer means and for removing particles from said water;

primary filter means for receiving said water from said prefilter means and for filtering bacteria from said water;

purifier means for receiving said water from said primary filter means and for purifying said water to remove therefrom residual bacteria and viral pathogens and for discharging said water as potable drinking water;

engine means for driving said pump means, said engine means being operable by an engine operating fluid, said engine means including control member means for controlling the supply of said engine operating fluid to said engine means, said control member means being movable between a first position, whereat said control member means allows access of said engine operating fluid to said engine means and thereby enables operation of said engine means and thus of said pump means, and a second position, whereat said control member means blocks access of said engine operating fluid to said engine means and thereby prevents operation of said engine means and thus of said pump means; and

shut down means for, upon the removal or substantial reduction of suction at said inlet of said pump means, automatically terminating operation of said engine means and thereby said pump means and for thus preventing damage to said pump means, said shut down means comprising:

pressure responsive means, operatively connected to said control member means and to said discharge of said pump means to be responsive to the discharge pressure thereat, for moving said control member means to said first position thereof when said discharge pressure is above a predetermined level;

biasing means, operatively connected to said control member means and operable in opposition to said discharge pressure, for immediately and rapidly moving said control member means to said second position thereof when said discharge pressure drops below the predetermined level as a result of the removal or substantial reduction of suction at said inlet of said pump means; and

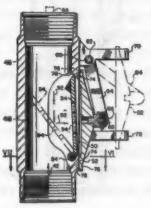
draining means for selectively draining said pressure responsive means of water therein as a result of the connection thereof to said discharge of said pump means.

4,333,828

AUTOMATIC DUMP VALVE

Donald F. Taylor, 3555 Vancouver, Dallas, Tex. 75229

Division of Ser. No. 58,927, Jul. 19, 1979. This application Sep. 15, 1980, Ser. No. 187,423
Int. Cl.³ B01D *35/14*
U.S. Cl. 210—113 **4 Claims**



1. A riser mounted, automatic subsea dump sub comprising:

a composite riser section having an internal bore defining a flow passage including upper and lower tool joint sections having pin and box connections at opposite ends for connection in series with a marine riser string;

a dump valve including a tubular housing section connected in the composite riser section between the upper and lower tool joints, the valve housing section having a sidewall opening defining a dump port in communication with the flow passage, a cover plate mounted for movement from a position of sealing engagement with the dump port to an open port position, and a deflector plate mounted for movement from a clear passage position wherein the deflector plate is retracted substantially out of the flow passage, to a dump position wherein the deflector plate is extended from the dump port transversely through the flow passage thereby defining a bypass channel for diverting falling solids through the dump port;

an actuator including a tubular housing section connected in the composite riser section between the upper and lower tool joints, the actuator housing section having a sidewall portion projecting into the flow passage thereby defining a constricted flow region, a tubular pressure chamber housing mounted in spaced relation around the actuator housing section and sealed at one end thereto defining an annular cavity, a piston assembly dividing the annular cavity into first and second pressure chambers, the sidewall portion having a flow opening connecting the constricted flow region in fluid communication with the first

pressure chamber whereby changes in fluid pressure in the constricted flow region resulting from changes in the rate of flow of fluid through the dump sub are transmitted to the first pressure chamber, and the second pressure chamber being connected for pressurization by ambient pressure; and,

linkage interconnecting the piston assembly, cover plate and deflector plate for moving the cover plate and deflector plate in response to extension or retraction of the piston due to a change in fluid pressure in the first pressure chamber caused by a change in flow rate through the dump sub.

4,333,829

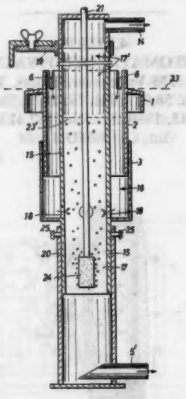
AQUARIA INLET MEANS

Gerhard Walther, Zeilsheimerstr. 27a, 6238 Hofheim, Taunus, Fed. Rep. of Germany

Filed Jul. 9, 1980, Ser. No. 166,992

Int. Cl.³ E04H *3/20*

U.S. Cl. 210—169 **7 Claims**



1. For use as an inlet means in an aquaria recirculating system utilizing a pump for removing water from the aquaria, passing it through a filter, and returning the filtered water back to the aquaria, the inlet comprising a first water tube with means for connection to a pump at its lower end, an open upper end, a second tubular assembly with an open lower end located within said first water tube and arranged for slidable movement with respect to said first tube, the second tubular assembly further comprising float means supporting an open upper end whereby water from the surface of a body of water may be collected, vertically-shaped inlet slots located in the surface of said first water tube, vertically adjustable closure means for said slots located behind said slots constructed and arranged to permit manual adjustment of the inlet opening size of said slots in varying fluid flow rate therethrough, whereby liquid may be simultaneously collected from both the upper surface and the lower regions of the body of water located in the aquaria, be filtered, and returned to the aquaria by said pump means.

4,333,830

VACUUM DRAIN SYSTEM

Harald Michael, Hamburg, Fed. Rep. of Germany, assignor to Electrolux GmbH, Hamburg, Fed. Rep. of Germany

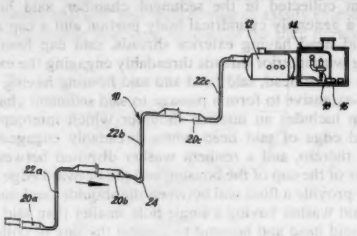
Filed Aug. 16, 1977, Ser. No. 825,027

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1976, 2637765

Int. Cl.³ C02F *9/00*

U.S. Cl. 210—170 **7 Claims**

1. An improved vacuum drain system comprising: a conduit adapted to be connected to a plurality of drain connections from which waste water is drained and comprising successively alternating sections which ascend and descend in the direction of flow through the conduit; a collector tank in fluid communication with said conduit for receiving liquid flowing therethrough; and suction means connected to said conduit for providing a vacuum in said collector tank to induce the flow of liquid through said conduit, at least one of said descending



conduit sections having a substantially larger cross section than that of an adjacent ascending conduit section, the said adjacent ascending conduit section being located downstream of the said at least one descending conduit section in the direction of fluid flow and being directly connected thereto so that the entire amount of fluid flowing in the descending conduit section will also flow in the ascending conduit section.

4,333,831

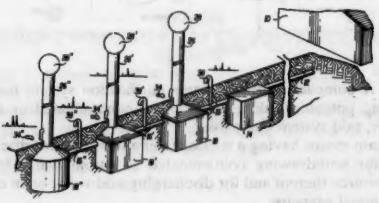
EVAPORATION SEPTIC TANK SEWAGE SYSTEM

Manfred W. A. Petzinger, Rte. 7, Box 87, Elizabethtown, Ky. 42701

Filed Dec. 22, 1980, Ser. No. 219,036

Int. Cl.³ C02F *1/04*

U.S. Cl. 210—170 **6 Claims**



1. An improved apparatus for evaporating liquids from fluent sewage, comprising:

a. a tank, having enclosing walls with an upwardly converging top wall;

b. a first conduit for directing a flow of fluent sewage into said tank;

c. a second conduit for directing overflow liquid sewage from said tank;

d. a third conduit extending upwardly from said first conduit, whereby air is drawn through said tank by convection;

e. at least one vapor stack extending from an upper portion of said tank, said vapor stack being closed at its upper end with a rotary ventilator;

f. at least one upwardly angled baffle member extending around the interior perimeter of said at least one vapor stack thereby preventing return flow of condensate from said at least one vapor stack into said tank;

g. at least one fourth conduit, communicating with the interior of said vapor stack adjacent said baffle member, for conveying return condensate to a point outside said vapor stack, said fourth conduit comprising means for prevent-

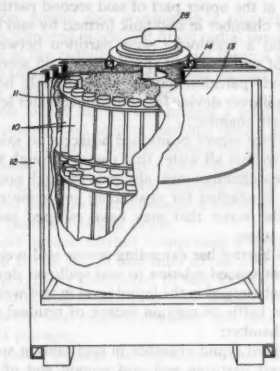
ing flow of air from said vapor stack through said fourth conduit.

4,333,832

ROTATING SOLUTION SEPARATION SYSTEM

Thomas L. Siwecki, 410 Civic Dr., Walnut Creek, Calif. 94596, and Gerry B. Andeen, Menlo Park, Calif., assignors to Thomas L. Siwecki, Walnut Creek, Calif.

Filed Aug. 29, 1977, Ser. No. 828,903
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—195.2 13 Claims



1. Apparatus for providing a reduced concentration solution and an increased concentration solution from an original solution comprising:

a rotating structure having an entry port for the original solution at its axis of rotation;

a cannister consisting of a confined container of reverse osmosis membrane material mounted at an off-axis position on the rotating structure;

means for radially flowing the original solution to the off-axis position and through the reverse osmosis membrane material to provide a reduced concentration solution;

means for collecting that portion of the original solution which has not flowed through the reverse osmosis membrane to provide an increased concentration solution; and

means for rotating the rotating structure.

4,333,833

IN-LINE DISINFECTANT CO. ACTOR

Karl E. Longley, San Antonio, Tex.; Brian Ratigan, Philadelphia, and James W. Davis, New Britain, both of Pa., assignors to Fischer & Porter Co., Warminster, Pa.

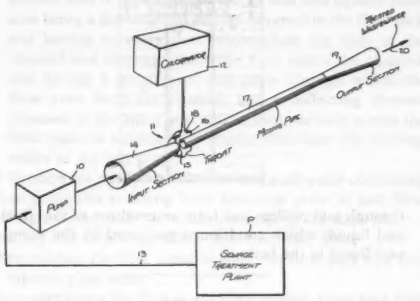
Filed May 8, 1978, Ser. No. 903,596
Int. Cl.³ C02F *1/68*
U.S. Cl. 210—198.1 2 Claims

1. A wastewater treatment system operating in conjunction with a wastewater treatment plant whose effluent is a stream of wastewater; said system being provided with an in-line contactor adapted to bring about intimate contact between a disinfectant and the wastewater stream to react the disinfectant with pathogens in the wastewater in a manner effecting rapid and efficient kills with minimal unwanted side effect and pump means to force said stream into the contactor under pressure, said contactor stream into the contactor under pressure, said contactor comprising:

A. an input flow section having a predetermined internal diameter through which the stream to be treated is forced under pressure, said section having a converging nozzle which projects the stream forwardly at high velocity; said treated effluent being fed to the inlet of said input flow section by an upstream line whose diameter matches the diameter of the inlet to the input section;

B. a throat surrounding the nozzle and including a lateral port coupling the throat to a disinfectant supply in the form of molecular chlorine;

C. an elongated mixing pipe in axial alignment with said input section and having a uniform internal diameter which is small relative to said predetermined diameter, the inlet of the pipe being coupled to said throat to receive the projected stream, the velocity of which is such as to render the stream highly turbulent in the pipe, the projected stream creating a vacuum in the throat educing disinfectant from the supply



which is intermingled with the turbulent stream in said pipe to effect the desired disinfection thereof, said mixing pipe being axially shiftable relative to said throat to adjust the position of said pipe inlet with respect to said lateral port; and

D. a diverging, pressure-reducing output flow section coupled to the outlet of said pipe and in axial alignment therewith, whereby the disinfected wastewater stream is discharged in a less-turbulent condition from the contactor, the outlet of said output flow section having a diameter which matches that of a downstream line coupled thereto and which also matches the diameter of the upstream line coupled thereto.

4,333,834

DEVICE FOR DISPERSING A FLUID IN A LIQUID AND IN PARTICULAR OZONIZED AIR IN WATER

Brandin Werner, Montmorency, France, assignor to Trailigaz, Compagnie Generale de l'Ozone, Garges les Gonesee, France

Filed Dec. 10, 1980, Ser. No. 214,906
Int. Cl.³ C02F *1/74*
U.S. Cl. 210—219 4 Claims

1. In a device for dispersing a fluid into a liquid, said device comprising a tank for receiving said liquid, an open-ended fluid supply tube extending into the tank for immersion in said liquid, and means defining a centrifugal pump coaxial with an end portion of the supply tube and communicating with the end portion of the supply tube by way of a centre inlet for projecting said fluid from the supply tube into said liquid surrounding the pump; the improvement comprising:

an induction enclosure interposed coaxially between and sealedly interconnecting the end portion of the supply tube and the pump inlet,

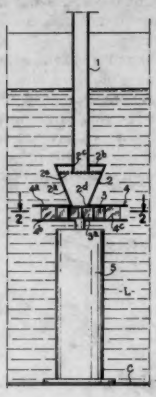
the induction enclosure having a substantially frustoconical shape and a smaller end and a larger end and being connected to the pump inlet adjacent said smaller end and connected to the lower end portion of the supply tube adjacent said larger end,

the end portion of the supply tube projecting into the enclosure but terminating short of the pump inlet,

the enclosure defining liquid induction orifices adjacent said larger end of the enclosure,

the orifices having a size which is small enough with respect to the flow through the pump to create a depression within the

enclosure in operation of the device and thereby draw into the enclosure said fluid from the supply tube and said liquid



through said orifices and form an emulsion of said fluid and said liquid, which emulsion is projected by the pump into said liquid in the tank.

4,333,835

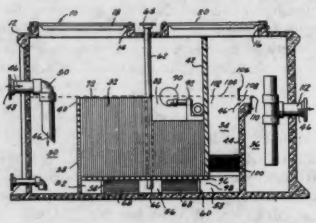
VERTICAL TUBE LIQUID POLLUTANT SEPARATORS

William M. Lynch, Glen Ellyn, Ill., assignor to AFL Industries, Inc., Riviera Beach, Fla.

Continuation-in-part of Ser. No. 768,266, Feb. 14, 1977, abandoned. This application May 19, 1978, Ser. No. 907,826

Int. Cl.³ B01D *23/06*

U.S. Cl. 210—305 **18 Claims**



1. A self-contained liquid pollutant-separating system for removing oils and settleable solids from incoming feed of water containing such oils and solids comprising:

(a) an insulated tank having a selective size with respect to said incoming feed to promote flow having laminar characteristics through said tank, said tank having an inlet means for said incoming feed at a first end of said tank and an outlet means for clairified water at a second end;

(b) a distribution chamber in said tank formed by said first end and a widthwise first partition spaced from said end and mounted between sidewalls of said tank, said partition having an open area to provide for passage of water from said distribution chamber;

(c) a separation chamber in said tank formed by said first partition and a widthwise second partition spaced from said first partition and mounted between said sidewalls of said tank, said second partition having a bottom edge spaced above a bottom of said tank to provide a submerged outlet for water from said separation chamber, said chamber further including a sludge accumulation area below a grate floor spaced above said bottom of said tank;

(d) separating means in said separation chamber comprising a plurality of vertically disposed perforated oleophilic and hydrophobic coalescing tubes through which all of the water entering the separating chamber from the discharge chamber through said open area in said first partition must pass transversely through the perforations in the tubes and contact the tubes both externally and internally, said tubes being supported above said grate and having upper open ends submerged below liquid level in said separation chamber and lower open ends opening downwardly toward said grate floor;

(e) oil accumulation means located in substantial alignment with the tops of said tubes to receive oil coalesced in said tubes and rising to said liquid level, and comprising trough means at the upper part of said second partition;

(f) a weir chamber in said tank formed by said second partition and a widthwise weir partition between said side walls of said tank and spaced from said second partition, said weir partition having an adjustable horizontal top edge spillover device for controlling water level in at least said weir chamber;

(g) fine filter means positioned adjacent to said submerged outlet so that all water that passes through said outlet to said weir chamber must also pass through said filter means which is adapted for coalescing any minute oil droplets from the water that may have escaped said separating means tubes;

(h) an oil barrier bar extending across said weir chamber in adjacent spaced relation to said spillover device and partially submerged in the liquid level in said weir chamber as a sheen baffle to restrain escape of residual oil from said weir chamber;

(i) a clarified liquid chamber in said tank in space between said weir partition and said second end of said tank to receive clarified water overflowing said weir partition over said spill over device, and providing a reservoir to supply said outlet; whereby said incoming feed of water enters the tank through said inlet into said distribution chamber and then enters said separation chamber, oils and settleable solids in said water are separated therefrom as said water flows transversely through the perforations in said tubes and contacts the tubes externally and internally, and separated oils are coalesced and ascend and are removed by way of said accumulation means and solids descend to said sludge accumulation area, the substantially clarified water flowing through said submerged opening and through said fine filter means into said weir chamber from which the substantially clarified water flows over said spill over device and into said clarified water chamber for discharge through said outlet.

4,333,836

CELLULAR DRUM FILTER FOR THE DEWATERING OF FIBER SUSPENSIONS

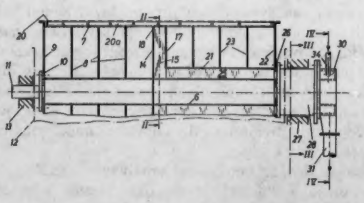
Fritz Peroutka, Heindenheim, Fed. Rep. of Germany, and Helmut Hirschfelder, Sao Paulo, Brazil, assignors to Voith S.A., Brazil

Filed Apr. 29, 1980, Ser. No. 144,916

Claims priority, application Brazil, Apr. 30, 1979, 5900592[U]

Int. Cl.³ B01D *33/06*

U.S. Cl. 210—404 **23 Claims**



1. A cellular drum filter for the dewatering of suspensions, comprising;

a filter drum; support means for supporting said filter drum for rotation;

said filter drum comprising:

an outer drum shell which is pervious to liquid and which has an inner surface;

suction cell forming means cooperating with and opposed to said inner surface of said outer drum shell for defining a plurality of hollow suction cells located radially inward from said outer drum shell inner surface; and

suction means for applying suction to said suction cells; said suction means comprising a first passage within said filter drum and a device for applying suction to said first passage;

said suction means also comprising a plurality of radial passages disposed inside said drum radial passage communicating at the radially outward end thereof with at least one said suction cell; each said radial passage also communicating with said first passage;

said suction means further comprising a control head disposed between said suction applying device and said first passage; said control head including radial passage selection means for permitting and prohibiting suction communication between said suction applying device and each of said radial passages in accordance with the predetermined angular positions of said drum;

said support means further comprising a hollow journal mounted at one end of said filter drum, said control head being operatively connected to said journal, said journal being configured to define second passages communicating between said control chamber and said channels of said first passage;

each said radial passage having a cross-section, in a plane perpendicular to the axis of rotation of said filter drum, with the general shape of a sector of a circle.

4,333,837

WATER PURIFICATION PROCESS AND APPARATUS

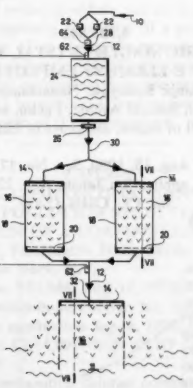
Sándor Plósz; Katalin Babos; Károly Rózsavolgyi, and Lajos Felföldy, all of Budapest, Hungary, assignors to Városépitési Tudományos és TervezöIntézet, Budapest, Hungary

Continuation of Ser. No. 929,275, Jul. 31, 1978, abandoned. This application Feb. 11, 1980, Ser. No. 119,855

Claims priority, application Hungary, Aug. 4, 1977, VA 1507

Int. Cl.³ C02F *3/32*

U.S. Cl. 210—602 **10 Claims**



1. Apparatus for purifying a flow of polluted water containing diffuse pollutants resulting from abalation prior to said flow reaching a living body of water, said apparatus comprising

settling means for removing rubble drift from said flow;

a first aquatic plant area adjacent a living body of water and having at least one natural and contiguous border therewith and directly communicating with said living body of water through said border, said first aquatic plant area having at least one distinct plant zone wherein aquatic plants biologically fix, immobilize or extract at least a part of the diffuse substances from the flow;

means for guiding the flow from said settling means and along at least one flow path to said first aquatic plant area; and

means in the path of said flow for increasing the surface area of the flowing polluted water in said first aquatic plant area so that substantially the entire width of the first aquatic plant area is covered by the flowing polluted water, said means in said flow path for increasing the surface area of the flowing water in said first aquatic plant area being a distribution channel disposed in the flow path and having an entry port intermediate the ends of the channel and through which the flow enters the channel, and having a plurality of exit ports through which the flow exits from the channel, and a deflecting element disposed in the entry port and at least partially across the flow path to substantially evenly distribute the flowing water to the exit ports.

6. Process for purifying a flow of polluted water containing diffuse pollutants resulting from abalation prior to said flow reaching a living body of water, comprising the steps of:

settling and removing rubble drift from said flow;

then guiding the flow along at least one flow path to a first aquatic plant area;

then contacting the flow in said first aquatic plant area with at least one distinct plant zone containing aquatic plants which biologically fix, immobilize or extract at least a part of the diffuse substances from the flow;

increasing the surface area of the flowing polluted water in the first aquatic plant area so that substantially the entire width of the first aquatic plant area is covered by the following polluted water;

then directly transmitting the flow from the first aquatic plant area to said living body of water through a natural border of said first aquatic plant area coextensive with and directly communicating with said living body of water, said step of increasing the surface area of the flowing polluted water in the first aquatic plant area being carried out by passing the flow into a distribution channel, deflecting the flow as it enters the channel, so that the flow is substantially evenly spread within the channel, then passing the substantially evenly spread flow out of the channel through a plurality of exit ports in a wall of the channel.

4,333,838

METHOD AND APPARATUS FOR PURIFYING AN ACTIVATED SLUDGE-WASTE WATER MIXTURE

Wilhelm Balnus, Burgwedel, Fed. Rep. of Germany, assignor to Schreiber-Kläranlagen Dr.-Ing. Aug. Schreiber GmbH & Co. KG, Langenhage, Fed. Rep. of Germany

Filed Mar. 24, 1981, Ser. No. 247,223

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1980, 3011247

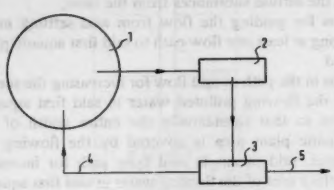
Int. Cl.³ C02F *3/26*

U.S. Cl. 210—614 **13 Claims**

1. A method of purifying an activated sludge-waste water mixture, which comprises the introduction of a gas comprising molecular oxygen to the mixture in an automatically controlled manner in dependence upon the state of purification of the waste water;

in which the state of purification of the waste water is moni-

tored by measuring the visible depth of the waste water and, depending upon this measurement, appropriate con-



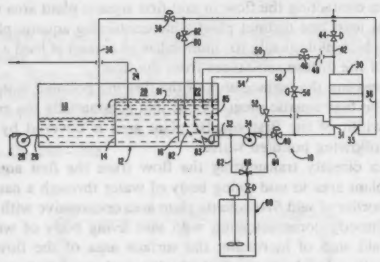
trol is applied automatically over the introduction of the gas to the mixture.

4,333,839

FILTER SYSTEM WITH IMPROVED BLOWDOWN COLLECTION AND RECIRCULATION MEANS

Richard E. Cardoza, Tiburon, and William D. Crowe, San Francisco, both of Calif., assignors to J. R. Schneider Co., Inc., Corte Madera, Calif.

Filed Nov. 26, 1980, Ser. No. 210,478
Int. Cl.³ B01D *37/02*
U.S. Cl. 210—777 **10 Claims**



7. In a method of filtering process liquid in a system having a filter operable in pre-coat, filtration and blowdown cycles, the improvement comprising: directing dirty process liquid into a first region adjacent to a second region for receiving clean liquid from the filter; providing a first chamber adjacent to the first region and in fluid communication therewith; pumping process liquid from the first chamber to the filter during the pre-coat and filtration cycles; allowing clean liquid from the filter to flow into the second region during the filtration cycle; allowing liquid and particulate material from the filter to flow into a second chamber adjacent to the first chamber during the pre-coat and filtration cycles, said first and second chambers being in fluid communication with each other during the pre-coat cycle; blocking fluid communication between the chamber during the blowdown cycles; and creating a cyclonic liquid action in said first chamber during the pre-coat and filtration cycles.

4,333,840

HYBRID PTFE LUBRICANT FOR WEAPONS

Franklin G. Reick, Westwood, N.J., assignor to Michael Ebert, Mamaroneck, N.Y., a part interest

Continuation-in-part of Ser. No. 218,008, Dec. 18, 1980, which is a continuation-in-part of Ser. No. 158,329, Jun. 10, 1980, Pat. No. 4,284,518. This application Feb. 12, 1981, Ser. No. 233,894
Int. Cl.³ C10M *5/10, 5/18*
U.S. Cl. 252—16 **7 Claims**

1. A hybrid lubricant especially adapted for use in firearms and similar applications that require a low viscosity lubricant, said hybrid lubricant comprising:

A. a minor amount of an additive constituted by a dispersion of polytetrafluoroethylene solid particles, a neutralizing agent stabilizing the dispersion to prevent agglomeration of the particles, and a fluid oil lubricant carrier of relatively high viscosity intermingled with the stabilized dispersion; and

B. a major amount of a synthetic fluid lubricant having a low viscosity diluting the additive.

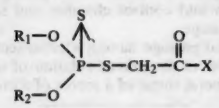
4,333,841

DITHIOPHOSPHATE LUBRICANT ADDITIVES

Andreas Schmidt, Reinach; Rudolf Kirchmayr, Aesch, both of Switzerland, and Donald R. Randell, Stockport, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 952,920, Oct. 19, 1978, abandoned, which is a continuation of Ser. No. 862,078, Dec. 19, 1977, abandoned. This application Sep. 5, 1980, Ser. No. 184,609
Int. Cl.³ C10M *71/46;* C07F *9/32*
U.S. Cl. 252—32.7 E **4 Claims**

1. A lubricant composition, which comprises a lubricant, which is a mineral oil, synthetic oil or mixture thereof having lubricating properties, and 0.001 to 5 percent by weight, based on the lubricant, of an extreme pressure and antiwear additive of the formula



wherein

R_1 and R_2 have the same meaning and each represents alkyl of 3 to 8 carbon atoms, or R_1 and R_2 together represent alkylene of 2 to 8 carbon atoms, and

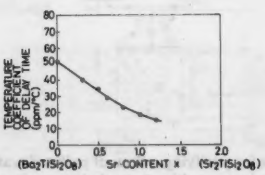
X represents —OH, —NR_3R_4 or —$OH.NR_3R_4R_5$ in which each of R_3, R_4 and R_5 independently represents hydrogen or alkyl of 3 to 18 carbon atoms.

4,333,842

PIEZOELECTRIC SINGLE CRYSTAL AND SURFACE ACOUSTIC WAVE ELEMENT EMPLOYING THE SAME

Yukio Ito, Kokubunji; Kazuyuki Nagatsuma; Sigeru Jyomura, both of Hachioji; Sakichi Ashida, Fuchu, and Hiroshi Takeuchi, Matsudo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 15, 1980, Ser. No. 178,593
Claims priority, application Japan, Aug. 22, 1979, 54-106097
Int. Cl.³ C04B *35/00*
U.S. Cl. 252—62.9 **2 Claims**



1. A piezoelectric single crystal characterized by having a composition which is represented by a general formula $(Ba_{2-x}Sr_x)TiSi_2O_8$ and in which the value x lies within a range of $0.25 \leqq x \leqq 1.2$.

4,333,843
GLYCOL COMPOSITIONS CONTAINING A HYDROLYZATE OF AN ORGANO PHOSPHORUS-SILICON COMPOUND

Phillip L. Wing, Lake Jackson, Tex., and George A. Sweeney, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 153,464, May 27, 1980, abandoned, which is a continuation-in-part of Ser. No. 59,412, Jul. 20, 1979, abandoned, which is a continuation-in-part of Ser. No. 939,100, Sep. 1, 1978, abandoned. This application Oct. 20, 1980, Ser. No. 198,973

Int. Cl.³ C09K *5/00*

U.S. Cl. 252—75 **18 Claims**

1. A gellation resistant aqueous glycol composition comprising

(A) 85 to 98 percent by weight of an alkylene glycol, an alkylene glycol ether, or mixtures thereof,

(B) an effective amount to reduce corrosion of an alkali metal silicate,

(C) an effective amount to improve gellation resistance of the hydrolyzate of organophosphorus-silicon compounds having the formula

$$(RO)_3Si(CH_2)_n—O—P(O)(CH_3)—OR$$

wherein r is an alkyl group of 1–4 carbon atoms, and n is an integer of 1–4, and

(D) the remainder being water, and an effective amount of one or more other corrosion inhibitors.

4,333,844
DETERGENT COMPOSITIONS

Peter M. Duggleby; Francis G. Foster, both of Wirral, England, and Jacobus R. Nooi, Hellevoetsluis, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 3, 1980, Ser. No. 203,172

Claims priority, application United Kingdom, Nov. 12, 1979, 7939123

Int. Cl.³ C11D *7/54*

U.S. Cl. 252—97 **10 Claims**

1. A particulate alkaline detergent composition for fabric washing consisting essentially of about 5% to about 40% by weight of at least one synthetic detergent compound, a builder system comprising a mixture of alkalimetal tripolyphosphate and an alkalimetal orthophosphate and an activated peroxygen bleach system comprising a mixture of a peroxy bleach compound in the form of an inorganic persalt together with an activator therefor, wherein said alkalimetal tripolyphosphate and the alkalimetal orthophosphate are present in a weight ratio of about 20:1 to about 3:1, and constitute about 5% to about 30% by weight of the composition.

4,333,845
COATING COMPOSITION THINNER FOR DECREASING POLLUTION RESULTING FROM THE APPLICATION OF A COATING COMPOSITION

James W. Garner, Farmington Hills, Mich., assignor to Grow Group, Inc., New York, N.Y.

Division of Ser. No. 932,948, Aug. 11, 1978, Pat. No. 4,265,944, which is a continuation-in-part of Ser. No. 739,203, Nov. 8, 1976, abandoned. This application Sep. 8, 1980, Ser. No. 185,326

Int. Cl.³ C09D *9/00*; C11D *7/50*

U.S. Cl. 252—170 **3 Claims**

1. A coating composition thinner comprising a completely water miscible organic based solvent capable of dissolving organic solvent based coating compositions comprising;

a. a water miscible compound selected from the group consisting of a saturated aliphatic glycol or a saturated aliphatic glycol ether, both containing at least 3 carbon atoms and a compound containing Formula I:

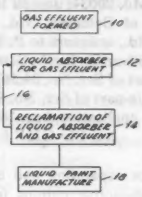
$$R—O\left[CH_2(R_1)—O\right]_nR_2 \quad (I)$$

wherein

R is independently selected from the group consisting of hydrogen, alkyl of from 1 to 4 carbon atoms and —(O)C—CH_3;

R_1 is independently selected from the group consisting of —CH_2, —CH_2—CH_2—, —CH_2—$CH(CH_3)$—, and —$CH(CH_2OH)$—;

R_2 is independently selected from the group consisting of alkyl of from 1 to 4 carbon atoms, hydroxyl substituted



alkyl of from 1 to 4 carbon atoms and —(O)C—CH_3; and

n is a number of from 1 to 4; and mixtures thereof, in an amount ranging from about 10 to about 60 parts by weight (PBW);

b. a water miscible monoalcohol having from 1 to about 8 carbon atoms, in an amount of about 10 to about 60 PBW; and

c. water miscible saturated aliphatic ketone of up to 12 carbon atoms in an amount of about 10 to about 50 PBW, the total of a+b+c equaling 100 PBW.

4,333,846
TRANSITION METAL ALUMINATES

John M. Lee, and William C. Bauman, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 939,545, Sep. 5, 1978, Pat. No. 4,221,767, which is a division of Ser. No. 812,534, Jul. 5, 1977, Pat. No. 4,116,856, and a continuation-in-part of Ser. No. 95,692, Nov. 19, 1979, which is a division of Ser. No. 939,545, Sep. 5, 1978, Pat. No. 4,221,767, which is a division of Ser. No. 812,534, Jul. 5, 1977, Pat. No. 4,116,856, and a continuation-in-part of Ser. No. 95,691, Nov. 19, 1979, abandoned, which is a continuation-in-part of Ser. No. 939,545, Sep. 5, 1978, Pat. No. 4,221,767, which is a division of Ser. No. 812,534, Jul. 5, 1977, Pat. No. 4,116,856. This application Sep. 4, 1980, Ser. No. 183,908

Int. Cl.³ B01D *15/04*

U.S. Cl. 252—184 **8 Claims**

1. A process for removing transition metal ions from aqueous solution, said transition metal ions being selected from the group consisting of Cu, Zn, Mn, Fe, Co, and Ni, said process comprising

contacting said aqueous solution with a crystalline transition metal aluminate conforming generally to the formula

$$MA_a{}^vZ_b{}^v.nAl(OH)_3.mH_2O$$

where M is at least one divalent transition metal selected from the group comprising Cu, Zn, Mn, Fe, Co, and Ni,

where AZ represents negative valence ions or radicals,

n is a value of from about 1 to about 4,

v is a negative valence of 1, 2, or 3,

a and b are each values of from zero to 2,

with (va)+(vb) equal to 2, and

with m being a value of zero or more;

wherein the transition metal in the aluminate structure corresponds to the transition metal in said solution, said transition metal aluminate being deficient in said transition metal ion at the outset,

continuing said contacting until the said transition metal aluminate has become substantially enriched by transition metal ions from the said aqueous solution.

4,333,847

FIXATION BY ANION EXCHANGE OF TOXIC MATERIALS IN A GLASS MATRIX

Danh C. Tran, Rockville, Md.; Pedro B. Macedo, 6100 Highboro Dr., Bethesda, Md. 20034; Joseph H. Simmons; Catherine J. Simmons, both of Bethesda, Md., and Nicholas Lagakos, Silver Spring, Md., assignors to P. B. Macedo, Bethesda and T. A. Litovitz, Silver Spring, both of, Md.

Continuation-in-part of Ser. No. 34,567, Apr. 30, 1979, which is a continuation-in-part of Ser. No. 959,220, Nov. 9, 1978, abandoned. This application Aug. 10, 1979, Ser. No. 65,752

Int. Cl.³ G21F *9/16*

U.S. Cl. 252—629 **62 Claims**

1. A process for separating and immobilizing radioactive anions and/or radioactive cations from a liquid containing same comprising contacting said liquid with a porous silica glass or gel comprising at least 82 mol percent silica having interconnected pores and (a) non-radioactive cationic organosiloxy groups bonded to silicon of the glass or gel on the internal surfaces of said pores and non-radioactive anions ionically bonded to said cationic organosiloxy groups and displaceable by said radioactive anions; and/or (b) non-radioactive anionic organosiloxy groups bonded to silicon of the glass or gel on the internal surfaces of said pores and non-radioactive cations ionically bonded to said anionic organosiloxy groups and displaceable by said radioactive cations; and/or (c) non-radioactive cationic polyvalent metals bonded to silicon of the glass or gel through divalent oxygen linkages on the internal surfaces of said pores and non-radioactive anions ionically bonded to said cationic metals and displaceable by said radioactive anions, to provide a distribution of radioactive anions and/or cations internally bonded within the pores of said glass or gel and heating the porous silicate glass or gel to collapse said pores containing said internally bonded radioactive anions and/or cations.

4,333,848

ATHERMAL LASER GLASS COMPOSITION

John D. Myers, Perrysburg, Ohio, and Charles S. Vollers, Blissfield, Mich., assignors to Kigre, Inc., Toledo, Ohio

Filed Dec. 3, 1980, Ser. No. 212,396

Int. Cl.³ C03C *3/04, 3/16;* **C09K** *11/42*

U.S. Cl. 252—301.4 P **15 Claims**

1. A temperature stable phosphate laser glass comprising a phosphate base glass composition and additions including 0.5 to 10 percent by weight of a lasing component and 0.5 to 5 percent by weight of a solarization inhibitor selected from the group consisting of SiO_2, Nb_2O_5 and Sb_2O_3, said phosphate base glass composition consisting essentially of the following, in mole percent:

P_2O_5	55-65%
Li_2O	6-12%
K_2O	0-10%
BaO	20-30%
CaO	0-10%
SrO	0-10%
Al_2O_3	1-4%

wherein the total of Li_2O and K_2O is less than 15 mole percent and the total of Al_3O_3 plus Nd_2O_3 as the lasing component is 4 ± 1.5 mole percent.

4,333,849

ENCAPSULATION PROCESS

Gary D. Pack, Waverly, and Frederick D. Weaver, Chillicothe, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Jun. 2, 1980, Ser. No. 155,683

Int. Cl.³ B01J *13/02*

U.S. Cl. 252—316 **13 Claims**

1. A process for the manufacture of microcapsules comprising the steps of:

(a) preparing a hydrophobic phase component comprising a homogeneous solution of an electron donating chromogenic material and a hydrophobic material;

(b) preparing a hydrophilic phase component comprising a mixture of a regulating agent and water, said regulating agent comprising a starch material, said regulating agent being present in said hydrophilic phase component at a concentration of from 3% to 40% by weight;

(c) combining said hydrophobic phase component and said hydrophilic phase component to form an oil-in-water emulsion; said oil-in-water emulsion further comprising

(i) an aqueous solution of urea;

(ii) an aqueous solution of resorcinol; and

(iii) an aqueous solution of formaldehyde;

(d) adjusting the pH of said oil-in-water emulsion to a level at which a wall forming reaction is initiated by the addition of a catalyst;

(e) elevating the temperature of said partially reacted oil-in-water emulsion to from about 50° C. to about 80° C.; and

(f) maintaining the temperature of said oil-in-water emulsion at from about 50° C. to 80° C. for a period of time sufficient to form discrete microcapsules characterized by being substantially impermeable to said hydrophobic emulsion component.

4,333,850

FILLED POLYMER COMPOSITION FOR AUTOMATIC ADDITION OF A CORROSION INHIBITOR TO A COOLANT SYSTEM

Robert H. Krueger, Palatine, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jun. 15, 1979, Ser. No. 49,005

Int. Cl.³ C23F *11/16, 11/18;* **F01P** *3/00*

U.S. Cl. 252—389 A **12 Claims**

1. A filled polymer composition for the automatic addition of a corrosion inhibitor to a coolant system, comprising an insoluble polymer, a slightly water soluble polymer and a soluble corrosion inhibitor, wherein powders of the three components are milled together and compression molded at an elevated temperature to form a solid member to be inserted in the circulating fluid of a coolant system, the corrosion inhibitor leaching out of the polymer to retain a proper level of corrosion inhibitor in the coolant.

4,333,851

OLEFIN POLYMERIZATION CATALYST, PROCESS AND POLYOLEFIN PRODUCT

John G. Speakman, Bo'ness, Scotland, and Nicholas P. Wilkinson, Kettering, England, assignors to BP Chemicals Limited, London and The University of Nottingham, Nottingham, both of, England

Filed Jul. 7, 1980, Ser. No. 166,197

Claims priority, application United Kingdom, Jul. 17, 1979, 7924895

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 B **11 Claims**

1. A supported Ziegler catalyst prepared by carrying out the following steps under substantially anhydrous conditions (A) reacting together a refractory oxide support material having acidic surface hydroxyl groups and an organo metallic compound wherein the metal is aluminum, boron, lithium, zinc or magnesium, (B) separating unreacted organo metallic com-

pound, if any, from the solid product obtained from step (A), (C) impregnating the solid product with a halogen-containing titanium compound and a halogen-containing vanadium compound in which the halogen is attached directly to the metal of said comounds and (D) separating unadsorbed titanium and vanadium compounds, if any, from the solid catalyst obtained from step (C).

4,333,852

CATALYST FOR THE SELECTIVE PRODUCTION OF ETHANOL AND METHANOL DIRECTLY FROM SYNTHESIS GAS

Barbara K. Warren, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 190,905, Sep. 25, 1980, Pat. No. 4,301,253. This application Jul. 6, 1981, Ser. No. 280,375

Int. Cl.³ B01J *31/18*

U.S. Cl. 252—429 R **6 Claims**

1. A catalyst for the direct production of ethanol or mixtures thereof with other alkanols containing up to three carbon atoms by the reaction of carbon monoxide and hydrogen comprising (a) a ruthenium compound, (b) a promoter, and (c) an organic phosphine oxide solvent wherein said ruthenium compound (a) is a compound capable of generating a soluble ruthenium complex under the reaction conditions, said promoter (b) is (i) elemental iodine or bromine or a compound thereof which is capable of generating hydrogen iodide or hydrogen bromide during said reaction and is charged at an amount sufficient to generate a hydrogen halide to ruthenium atom mole ratio of from 0.001:1 to 5:1 in said reaction mixture, or (ii) an alkali halide at a ratio to ruthenium atom as high as 20:1, or (iii) mixture thereof, and said organic phosphine oxide solvent (c) is present at a concentration of from 1 to 100 weight percent of the total solvent charged.

4,333,853

MIXED VANADIUM PHOSPHORUS OXIDE CATALYSTS AND PREPARATION THEREOF

Ernest C. Milberger, Solon; Noel J. Bremer, Stow, and Dennis E. Dria, Cleveland, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 5, 1980, Ser. No. 146,971

Int. Cl.³ B01J *23/22, 27/18*

U.S. Cl. 252—435 **27 Claims**

1. A process for the preparation of oxidation catalysts containing the mixed oxides of vanadium and phosphorus which comprises the steps of

(a) introducing a substantially pentavalent vanadium-containing compound and a pentavalent phosphorus-containing compound into an organic liquid medium capable of reducing the vanadium to a valence state less than +5;

(b) effecting the reduction of at least a portion of the vanadium to a valence state of +4 while in the presence of the phosphorus-containing compound and in the absence of a corrosive reducing agent by heating the vanadium-containing reducing medium of step (a);

(c) recovering the mixed vanadium phosphorus oxide-containing catalyst precursor;

(d) drying the catalyst precursor;

(e) calcining the catalyst precursor to form the active oxidation catalyst.

4,333,854

SULFIDED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 45,024, Jun. 4, 1979, Pat. No. 4,246,095, which is a continuation-in-part of Ser. No. 833,332, Sep. 14, 1977, Pat. No. 4,165,276. This application Oct. 23, 1980, Ser. No. 199,778

The portion of the term of this patent subsequent to Aug. 21, 1996, has been disclaimed.

Int. Cl.³ B01J *27/02*

U.S. Cl. 252—439 **17 Claims**

1. A catalytic composite comprising a sulfided combination of both (1) a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material and (2) a uniform dispersion of catalytically effective amounts of a platinum group component which is maintained in the elemental metallic state during the incorporation and pyrolysis of the rhenium carbonyl component.

4,333,855

PROMOTED ZINC TITANATE AS CATALYTIC AGENT

Lloyd E. Gardner; Floyd E. Farha, Jr.; Alan D. Eastman, and Lewis E. Drehman, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 125,429, Feb. 18, 1980, abandoned. This application Apr. 30, 1981, Ser. No. 258,976

Int. Cl.³ B01J *21/06, 23/40, 23/06*

U.S. Cl. 252—439 **9 Claims**

1. A catalyst composition comprising zinc, titanium, and at least one promoter selected from the group consisting of vanadium, chromium, cobalt, molybdenum, tungsten, platinum, palladium, rhodium, ruthenium, and compounds thereof, wherein the concentration by weight of said at least one promoter in said catalyst composition is less than the total concentration by weight of said zinc and said titanium in said catalyst composition and wherein said catalyst composition is prepared by calcining a mixture of zinc oxide and titanium dioxide in the presence of molecular oxygen at a temperature in the range of about 650° C. to about 1050° C. to form zinc titanate and adding said at least one promoter to said zinc titanate to form said catalyst composition.

9. A composition in accordance with claim **1** wherein said catalyst composition is completely sulfided after said at least one promoter is added to said zinc titanate.

4,333,856

HYDROCARBON ISOMERIZATION CATALYST AND PROCESS

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 68,278, Aug. 20, 1979, Pat. No. 4,256,566, which is a continuation-in-part of Ser. No. 833,332, Sep. 14, 1977, Pat. No. 4,165,276. This application Dec. 3, 1980, Ser. No. 212,641

The portion of the term of this patent subsequent to Jul. 23, 1998, has been disclaimed.

Int. Cl.³ B01J *27/08, 27/10*

U.S. Cl. 252—441 **8 Claims**

1. A catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing a uniform dispersion of catalytically effective amounts of a platinum group component, which is maintained in the elemental metallic state during the incorporation and pyrolysis of the rhenium carbonyl component, of a tin component, of a halogen component and of about 1 to about 100 wt. % of a Friedel-Crafts metal halide calculated on a Friedel-Crafts metal halide-free basis.

4,333,857

ATTRITION RESISTANT ZEOLITE CONTAINING CATALYST

John Lim, Anaheim; Michael Brady, Studio City, and Dennis Stamires, Newport Beach, all of Calif., assignors to Filtrol Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 3,407, Jan. 15, 1979, Pat. No. 4,086,187. This application Mar. 17, 1980, Ser. No. 130,715

Int. Cl.³ B01J *29/08, 35/08*

U.S. Cl. 252—455 Z 17 Claims

1. A process for forming a hydrocarbon conversion catalyst comprising comminuting crystals of a zeolite of the faujasite type and combining the comminuted zeolite with pseudoboehmite, clay and ammonium polysilicate or silica sol in a water slurry, spray drying said water slurry and forming microspheres.

2. The process for producing microspheres of hydrocarbon conversion catalyst comprising comminuting crystals of a Y type zeolite in amount in the range of about 10% to about 50% and combining said comminuted zeolite in a slurry containing about 10% to about 50% pseudoboehmite, and ammonium polysilicate or silica sol, the amount of said ammonium polysilicate or silica sol expressed as the equivalent SiO_2 being in the range of about 5% to about 30% and kaolin clay in the range of from about 10% to about 30% and spray drying said slurry to form microspheres, said percentages being by weight based on the microspheres on a volatile free basis, comminuting the said slurry and spray drying said comminuted slurry.

4,333,858

CATALYST WITH MO, V, TI AND PROCESS

Harry J. Decker, and Erlind M. Thorsteinson, both of Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 408,416, Oct. 23, 1973, abandoned. This application May 5, 1980, Ser. No. 146,221

Int. Cl.³ B01J *23/16, 23/84*

U.S. Cl. 252—455 R 9 Claims

1. An oxidation catalyst containing the elements Mo, V, Ti, and X in the ratio

$$Mo_aV_bTi_cX_d$$

wherein X is selected from the group consisting of Fe, Cu, Co, Cr and/or Mn

a is 12,

b is 1 to 14,

c is 0.1 to 12, and

d is 0.01 to 1.0.

3. A catalyst as in claim 1 in which said support is silica, alumina, or silica-alumina.

4,333,859

HIGH SILICA FAUJASITE POLYMORPH - CSZ-3 AND METHOD OF SYNTHESIZING

David E. W. Vaughan, Flemington, N.J., and Michael G. Barrett, Severna Park, Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Oct. 27, 1980, Ser. No. 201,260

Int. Cl.³ C01B *33/28;* B01J *29/08*

U.S. Cl. 252—455 Z 18 Claims

1. A high silica faujasite aluminosilicate having a silica to alumina ratio of between 5.0 and 7.0 and having cesium ions trapped in the sodalite cages.

3. A hydrogen exchanged high silica faujasite aluminosilicate produced by exchanging the faujasite aluminosilicate of claim 1 with an ammonium solution followed by heating so as to increase the hydrogen ion content.

4,333,860

SOLUBILIZED CHROMIUM SALT IN POLYMERIZATION CATALYST

Gil R. Hawley, and Max P. McDaniel, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 14, 1979, Ser. No. 103,686

Int. Cl.³ B01S *23/26*

U.S. Cl. 252—458 11 Claims

1. A process for producing a catalyst comprising:

contacting a chromium-containing salt, which is insoluble in nonaqueous solvents which do not easily rehydrate silica, with a solubilizing agent thus converting it to a chromium-containing complex having charged ions which is soluble in said nonaqueous solvents;

impregnating a particulate support with the thus solubilized chromium-containing complex dissolved in a nonaqueous solvent which does not easily rehydrate silica; and

activating said thus impregnated support by heating same in an oxygen ambient at a temperature sufficient to oxidize at least a portion of said chromium.

4,333,861

THICK FILM VARISTOR

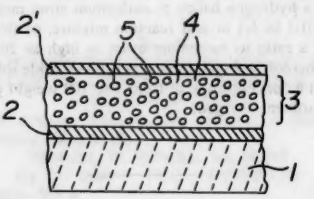
Masaki Aoki, Hirakata, and Mitsuhiro Ohtani, Sakai, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation of Ser. No. 850,851, Nov. 11, 1977, abandoned. This application Apr. 5, 1979, Ser. No. 27,392

Claims priority, application Japan, Nov. 26, 1976, 51-142450

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—518 7 Claims



1. A thick film varistor comprising a thick film consisting essentially of 20 to 85 weight percent of finely divided particles of tin oxide dispersed in 15 to 80 weight percent of glass frit, said glass frit being a zinc antimony barium borate glass consisting essentially of 15 to 40 weight percent of ZnO, 0.1 to 10 weight percent of Sb_2O_3, 10 to 40 weight percent of BaO and 30 to 45 weight percent of B_2O_3, said tin oxide having incorporated therein an additive selected from 0.1 to 15 weight percent of one of vanadium oxide (V_2O_5), molybdenum oxide (MoO_3), zirconium oxide (ZrO_2), indium oxide (In_2O_3), thorium oxide (ThO_2) or phosphorus oxide (P_2O_5).

4,333,862

DETERGENT COMPOSITIONS COMPRISING MIXTURE OF CATIONIC, ANIONIC AND NONIONIC SURFACTANTS

Rory J. M. Smith, Rowlands Gill, and Allan C. McRitchie, Blyth, both of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 156,005, Jun. 3, 1980, abandoned, which is a continuation of Ser. No. 919,536, Jun. 26, 1978, abandoned. This application Feb. 9, 1981, Ser. No. 232,930

Claims priority, application United Kingdom, Jun. 29, 1977, 27275/77

Int. Cl.³ C11D *1/86, 17/00*

U.S. Cl. 252—547 10 Claims

1. A liquid detergent composition comprising from 2-100%

of a surfactant system consisting essentially of a water-soluble combination of anionic, ethoxylated nonionic and quaternary ammonium cationic surfactants; wherein the anionic:cationic surfactant weight ratio is less than 5:1; wherein the nonionic:-cationic surfactant weight ratio is in the range from 5:1 to 2:3; wherein the surfactant system contains anionic and cationic surfactants in an equivalent ratio of at least 1:1; wherein said nonionic surfactant has the formula

$$RO(C_2H_4O)_nH$$

wherein R is primary or secondary, branched or unbranched C_{8-24} alkyl or alkenyl or C_{6-12} alkyl phenyl, and n, the average degree of ethoxylation, is from 2 to 9; and wherein said quaternary ammonium cationic surfactant is selected from the group consisting of quaternary ammonium salts having one fatty alkyl group containing from 12 to 14 carbon atoms and three groups which contain 1 to 4 carbon atoms or are benzyl with no more than one of said groups being benzyl, and mixtures of said salts.

4,333,863

WATER RESISTANT TEXTURIZED WALL COVERINGS

Thomas A. Lindroth, Spring Valley, Calif., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 12, 1981, Ser. No. 233,738
Int. Cl.³ C08L *5/00*
U.S. Cl. 523—220 **9 Claims**

1. A wall covering composition comprising at least 75% of

MATERIAL	RANGE BY WT.	MAXIMUM SIZE
Paper Pulp Fibers	10–30%	5 mm length
Textile Linters	10–30%	5 mm length
Cotton Threads	5–15%	3 mm length
Polyester Threads	5–15%	3 mm length
Wood Chips	40–60%	1 mm diameter
Grain Shafts	5–10%	10 mm length

and about 3 to about 20 wt.% of a gum blend comprising algin and TKP in the weight:weight ratios of 20:80 and 5:95.

4,333,864

PROCESS FOR PRODUCING IMPROVED ALKYD RESIN EMULSIONS

Bertram Zückert, Graz, Austria, assignor to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Oct. 27, 1980, Ser. No. 201,345
Claims priority, application Austria, Oct. 29, 1979, 6965/79
Int. Cl.³ C08L *33/02*
U.S. Cl. 525—501.5 **12 Claims**

1. Process for producing water-emulsifiable air drying paint binders based on modified alkyd resins having a fatty acid content of from 15 to 50% by weight and a polyethylene glycol content of from 3 to 8% and which are obtained through condensation of a polyethylene glycol with an average molecular weight of between 500 and 5000 and a low molecular alkyl- and/or arylphenol resol and an oil fatty acid ester with an iodine number of at least 125, and through reaction of the condensate with mono- and dicarboxylic acids and the normally used alcohol components, characterized in that—

(A) 50–92% by weight of a polyethyleneglycol-resol-modified alkyd resin intermediate with an acid value of below 15, an intrinsic viscosity of from 4 to 8 ml/g (chloroform/20° C.), and a hydroxyl number of from 50 to 250 mg KOH/g, and

(B) 8–50% by weight of a polymer, obtained through free radical polymerization at 80° to 140° C. of

6–40% by weight of methacrylic acid,

20–55% by weight of a drying oil fatty acid with an iodine number of at least 125 and

20–70% by weight of one or more vinyl- and/or vinylidene compounds containing no other reactive groups other than the double bond,

are esterified at 170° to 200° C. to an acid value of from 10 to 30, and an intrinsic viscosity of from 8 to 12 ml/g (chloroform/20° C.).

4,333,865

AQUEOUS EMULSION OF AIR DRYING AND STOVING ALKYD RESINS AND PROCESS FOR PRODUCING SAID RESINS

Bertram Zückert, Graz, Austria, assignor to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Nov. 10, 1980, Ser. No. 205,192
Claims priority, application Austria, Nov. 19, 1979, 7335/79; Aug. 29, 1980, 4371/80
Int. Cl.³ C08L *33/02*
U.S. Cl. 523—410 **23 Claims**

1. Process for producing improved aqueous emulsions for air drying and stoving paints based on polyethyleneglycol-modified alkyd resins, characterized in that

(a) fatty acid esters are provided wherein the saturated or unsaturated fatty acid radicals carry more than 10 carbon atoms and contain ether-like bound polyethyleneglycol radicals having an average molecular weight of between 500 and 5000;

(b) the fatty acid esters of (a) are reacted through re-esterification with alkyd resin materials to provide an alkyd resin intermediate with an acid value of below 15 mg KOH/g, a hydroxyl value of between about 50 and 250 mg KOH/g, and a PEG-level of from about 3.5 to 15% by weight;

(c) 50 to 90% by weight of alkyd resin intermediate (b) are esterified with from 10 to 50% by weight of a copolymer containing

6–40% by weight of methacrylic acid,

20–55% by weight of an unsaturated oil fatty acid with an iodine number of at least 125, and

20–70% by weight of one or more vinyl and/or vinylidene compound free from reactive functional group other than ethylenic double bonds,

until an acid vaue of from about 10 to 35 mg KOH/g and an intrinsic viscosity in chloroform at 20° C. of from about 6 to 15 ml/g is attained, with a PEG-level of from about 3 to 8%, and

(d) emulsifying the modified alkyd resin (c) in water with neutralization of the carboxy groups with ammonia or amines and the addition of up to a maximum of 20% by weight of organic auxiliary solvents.

4,333,866

ASPHALT COMPOSITION

William E. Uffner, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jun. 16, 1980, Ser. No. 159,526
Int. Cl.³ C08L *91/00*
U.S. Cl. 524—534 **15 Claims**

1. A chemically-modified asphalt composition comprising an asphalt which has been reacted with (1) a polymerizable vinyl aromatic monomer which has the formula:

$$R_1—C(R_2)=C(R_2)—R_3$$

wherein R_1 is an aromatic group containing 6 to 12 carbon atoms, R_2 is hydrogen or methyl and R_3 is selected from the group consisting of $—CH_2OH$, —CHO, —COX wherein X is halogen, —COOH and $—CH_2CN$ and (2) a rubbery polymer.

4,333,867

CERAMIC TILE ADHESIVES

Barry J. Sauntson, Higham Ferrers, England, assignor to Scott Bader Company Limited, Northamptonshire, England

Filed Feb. 23, 1981, Ser. No. 236,725

Claims priority, application United Kingdom, Mar. 3, 1980, 8007092

Int. Cl.[3] C08L 43/04

U.S. Cl. 524—547 9 Claims

1. An aqueous emulsion polymer composition for use as a ceramic tile adhesive, which composition contains a large quantity, based on the weight of solid polymer, of filler material and an emulsion polymer of at least one acrylate monomer selected from acrylates and methacrylates and at least one vinyl aromatic monomer, which emulsion polymer is prepared in the presence of at least one unsaturated organo-silicon compound to improve retention of adhesive strength of the adhesive composition on exposure to moisture.

4,333,868

PHOSPHITE ESTER STABILIZERS

Andreas Schmidt, Reinach, and Kurt Schwarzenbach, Pfeffingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

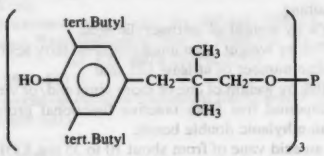
Continuation of Ser. No. 948,939, Oct. 6, 1978, abandoned, which is a division of Ser. No. 709,135, Jul. 27, 1976, Pat. No. 4,132,702, which is a continuation-in-part of Ser. No. 561,394, Mar. 24, 1975, abandoned. This application Dec. 17, 1979, Ser. No. 104,502

Claims priority, application Switzerland, Mar. 27, 1974, 004282/74

Int. Cl.[3] C07F 9/145; C08K 5/52

U.S. Cl. 524—152 2 Claims

1. The compound



2. A composition of matter comprising polypropylene stabilized by the compound of claim 1.

4,333,869

SELF-EXTINGUISHING POLYMERIC COMPOSITIONS

Franco Marciandi, Rho, and Pasquale Relvini, Bollaten, both of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Sep. 15, 1980, Ser. No. 187,048

Claims priority, application Italy, Sep. 18, 1979, 25790 A/79

Int. Cl.[3] C08K 3/32, 5/34

U.S. Cl. 524—100 15 Claims

1. Self extinguishing polymeric compositions, comprising a thermoplastic polymer and an anti-flame additive consisting of:

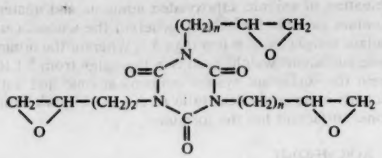
(1) 10–25% by weight, on the total composition, of an ammonium polyphosphate or amine phosphate; and

(2) 10–25% by weight, on the total composition, of a product obtained by reacting in bulk, at a temperature comprised between 80° C. and 230° C.,

(a) at least one organic compound selected from the group consisting of

(i) urea, N,N'-dimethylurea, thiourea, ethyleneurea, hydantoin, isocyanuric acid, mixtures of ethyleneurea and melamine, mixtures of ethyleneurea and isocyanuric acid, mixtures of urea and melamine, mixtures of ethylene urea and acetoguanamine; with

(b) an epoxyalkyl ester of isocyanuric acid of the formula:



wherein n is an integer from 1 to 3;

the reaction being carried out according to a molar ratio (a):(b) comprised between 3:1 and 0.1:1.

4,333,870

PROCESS FOR SEPARATING γ-GLOBULIN AGGREGATE BY POLYSULFONE MEMBRANE

Kenji Koyama; Syotaro Ohno, both of Tokuyama, and Mitsutoshi Fukuda, Shin-nanyo, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

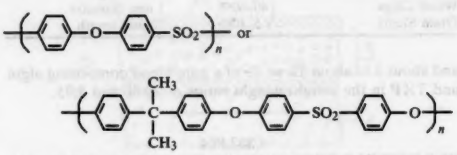
Filed Sep. 17, 1980, Ser. No. 188,118

Claims priority, application Japan, Oct. 22, 1979, 54-135137

Int. Cl.[3] C07G 7/00

U.S. Cl. 260—112 B 3 Claims

1. A process for separating γ-globulin aggregate by a membrane which comprises separating γ-globulin aggregate from an aqueous solution of γ-globulin through an ultrafiltration membrane made of a polysulfone resin having the formula



(n = 50 to 250)

4,333,871

COAGULATION METHOD FOR PREPARING LEAF PROTEIN CONCENTRATES (LPC) FROM PLANT FOLIAGE

Donald W. De Jong, Youngsville, N.C., assignor to International Harvester Company, Chicago, Ill.

Filed Mar. 18, 1981, Ser. No. 244,843

Int. Cl.[3] A23J 1/14

U.S. Cl. 260—112 R 11 Claims

1. A method of separating protein from a photosynthetic organism comprising:

disrupting cells of said photosynthetic organism to form a green juice;

adding a crosslinking reagent to said green juice;

lowering the pH of said green juice to a value in the range of 3.0 to 5.0 to cause said protein to precipitate and to form a coagulum; and

separating said coagulum from said green juice.

4,333,872

METHOD OF PRODUCING α-L-ASPARTYL-L-PHENYLALANINE METHYLESTER

Prathivadibhayankaram S. Sampathkumar, Parsippany, and Basant K. Dwivedi, Randolph, both of N.J., assignors to Chimicasa GmbH, Switzerland

Continuation-in-part of Ser. No. 150,881, May 27, 1980, abandoned. This application Sep. 19, 1980, Ser. No. 185,721

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R 15 Claims

1. In a method for the preparation of an alkyl ester of α-L-aspartyl-L-phenylalanine which method comprises:

condensing a monovalent alkali-ester mixed anhydride aspartate compound having an amino-protective group under alkaline condition with an alkyl ester of phenylalanine to produce an amino-protected ester condensate compound;

the improvement which comprises:

(a) providing an amino-protective group which is acid-removable with the ester group; and

(b) reducing the pH of the amino-protected ester condensate compound to an acidic condition to remove the amino protective ester group and to form the alpha and beta mixture of the alkyl ester of α-L-aspartyl-L-phenylalanine.

4,333,873

PHARMACOLOGICALLY ACTIVE PEPTIDES

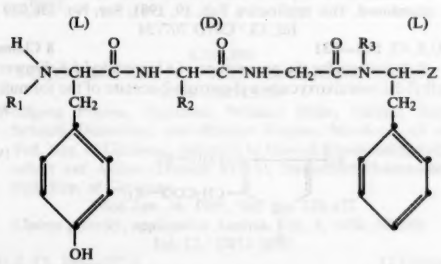
Robert T. Shuman, Greenwood, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 104,349, Dec. 17, 1979, Pat. No. 4,283,330. This application Apr. 24, 1981, Ser. No. 257,454

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 E 14 Claims

1. A compound of the formula



and pharmaceutically acceptable non-toxic acid addition salts thereof, in which L and D define the chirality;

R_1 is hydrogen or C_1–C_3 primary alkyl;

R_2 is C_1–C_4 primary or secondary alkyl, allyl, cyclopropylmethyl, C_1–C_2 hydroxyalkyl, or $-(CH_2)_m-U-CH_3$ in which U is —S— or >S—O and m is 1 or 2;

R_3 is allyl; and

Z is

in which R_4 is hydrogen, acetyl, or acetoxymethyl and R_5 is C_1–C_3 alkyl.

4,333,874

CATIONIC TRIAZINYLAMINO AZO DYESTUFFS

Horst Nickel, Leverkusen; Friedhelm Müller, Odenthal, and Peter Mummenhoff, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

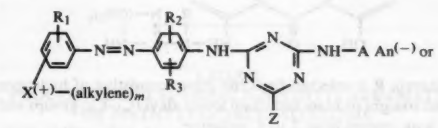
Filed Jul. 28, 1980, Ser. No. 172,506

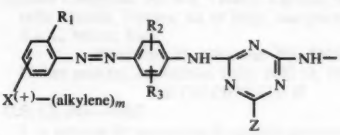
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1979, 2933031

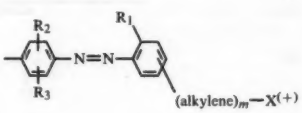
Int. Cl.³ C07C *107/06;* C09B *44/02, 62/085*

U.S. Cl. 260—153 4 Claims

1. Cationic azo dyestuffs of the general formula







2 $An^{(-)}$

wherein

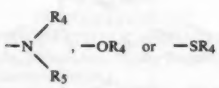
$X^{(+)}$ denotes an ammonium group,

m denotes 0 or 1,

R_1 denotes hydrogen, C_1- to C_4-alkyl, C_1- to C_4-alkoxy or halogen,

R_2 and R_3 independently of one another denote hydrogen, C_1- to C_4-alkyl, C_1- to C_4-alkoxy or acylamino,

Z denotes halogen or a radical of the formula



R_4 and R_5 independently of one another denote hydrogen, or C_1- to C_4-alkyl, cyclohexyl, phenyl, benzyl or phenylethyl, it being possible for these radicals to be substituted by hydroxyl, C_1- to C_4-alkoxy, chlorine or cyano and for the cyclohexyl, phenyl, benzyl and phenylethyl radical additionally to be substituted by C_1- to C_4-alkyl, or

R_4 and R_5, together with the nitrogen atom to which they are bonded, denote a 5- or 6-membered ring,

A denotes an aryl radical and

$An^{(-)}$ denotes an anion.

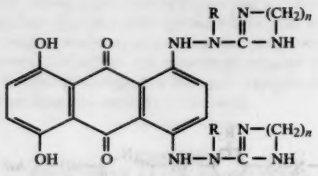
4,333,875

5,8-DIHYDROXY-1,4-BIS(GUANIDINYLAMINO)ANTHRAQUINONES

Keith C. Murdock, Pearl River, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 87,908, Oct. 24, 1979, Pat. No. 4,275,010.
This application Feb. 4, 1981, Ser. No. 231,566
Int. Cl.³ C07D *403/12*
U.S. Cl. 260—239 BC 8 Claims

1. A compound selected from the group consisting of those of the formula:



(I)

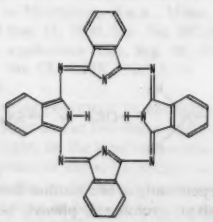
wherein R is selected from the group consisting of hydrogen and straight or branched chain lower alkyl (C_1–C_4) groups and n is an integer from 2 to 4, inclusive.

4,333,876

PROCESS FOR THE PREPARATION OF METAL DIPHTHALOCYANINES

George Elliott, Sandon, and Brian W. Ely, Braintree, both of England, assignors to The Marconi Company Limited, Chelmsford, England

Filed Nov. 18, 1980, Ser. No. 208,118
Claims priority, application United Kingdom, Nov. 23, 1979, 7940543
Int. Cl.³ C09B *47/04*
U.S. Cl. 260—245.73 12 Claims



1. A process for the preparation of a metal diphthalocyanine of the general formula $(PC)_2H.M^{III}$ or $(PC)_2.M^{IV}$ wherein M^{III} and M^{IV} represent, respectively, a tri- and tetravalent metal, and PC represents the phthalocyanine ring system, comprising reacting the metal in the form of a complex with a 2,4-diketone with a large molar excess, based on the metal, of a phthalocyanine, to give the desired metal diphthalocyanine.

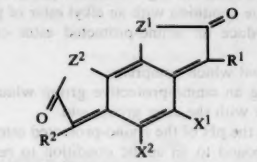
4,333,877

SUBSTITUTED 2,7-DIOXO-2,7-DIHYDROBENZO[1:2-B; 5:6-B¹]DIFURAN OR -DIPYRROLE DYESTUFFS, THEIR PREPARATION AND THEIR USE

John L. Carey, Rochdale, and Colin W. Greenhalgh, Manchester, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jul. 10, 1980, Ser. No. 168,446
Claims priority, application United Kingdom, Jul. 18, 1979, 7925030
Int. Cl.³ C07D *209/56, 307/77, 493/04*
U.S. Cl. 548—421 4 Claims

1. Dyestuffs characterised by the general formula:



(I)

wherein Z^1 and Z^2 each independently represent oxygen or —NH—; R^1 and R^2 each independently represent unsubstituted naphthyl, unsubstituted phenyl, 3,4-methylenedioxyphenyl or phenyl substituted by at least one of C_1–C_4 alkyl, C_1–C_4 alkoxy, nitro, acetylamino, or halogen; X^1 and X^2 each independently represent hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen or hydroxy, or X^1 and X^2 together form a 6-membered benzene ring which is unsubstituted or substituted by at least one of halogen or nitro.

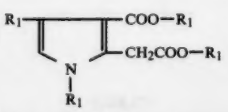
4,333,878

PROCESS FOR PRODUCING SUBSTITUTED PYRROLES

Michael J. Dagani, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

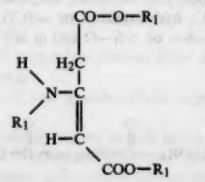
Continuation-in-part of Ser. No. 137,510, Apr. 4, 1980, abandoned. This application Feb. 19, 1981, Ser. No. 236,039
Int. Cl.³ C07D *207/34*
U.S. Cl. 548—531 8 Claims

1. A process for the preparation of a loweralkyl 1,4-diloweralkyl-3-loweralkoxycarbonyl-pyrrole-2-acetate of the formula:



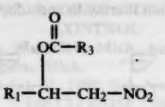
IV

wherein each R_1 is independently a loweralkyl group which comprises reacting a mixture of a loweralkyl enamine of a diloweralkyl acetone dicarboxylate of the formula:



V

with a compound of the formula:



VI

wherein R_1 is independently selected and has the same meaning as hereinabove and R_3 is a lower alkyl, tolyl or benzyl group.

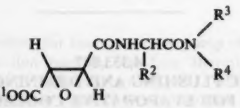
4,333,879

EPOXYSUCCINIC ACID DERIVATIVES

Masaharu Tamai; Takashi Adachi; Shigeo Morimoto; Kiyoshi Oguma; Kazunori Hanada, and Sadafumi Omura, all of Saitama, Japan, assignors to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Jan. 3, 1980, Ser. No. 109,410
Claims priority, application Japan, Feb. 27, 1979, 54/22365
Int. Cl.³ C07D *303/48, 405/12;* C07C *103/52*
U.S. Cl. 549—549 3 Claims

1. An epoxysuccinic acid derivative of the formula



wherein

R^1 is hydrogen, alkali metal, alkyl having 1–2 carbon atoms, cycloalkyl having 5–6 carbon atoms or benzyl,

R^2 is a branched chain alkyl group having 3–4 carbon atoms or benzyl,

R^3 is hydrogen or methyl, and

R^4 is alkyl having 1–10 carbon atoms, phenyl benzyl, phenethyl, or cycloalkyl having 3–6 carbon atoms, or

R^3 and R^4 taken together with the nitrogen atom to which they are attached form a pyrrolidino heterocyclic ring, or said heterocyclic ring substituted with a protected carboxy.

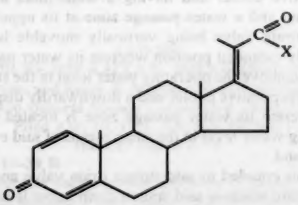
4,333,880

3-OXO-PREGNA-1,14,17-TRIEN-20-CARBOXYLATES AND PROCESS

Wolfgang Preuss, Monheim; Michael Bahn, Hilden; Rolf Schmid, Düsseldorf, and Rüdiger Wagner, Monheim, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Jan. 26, 1981, Ser. No. 228,177
Claims priority, application Austria, Feb. 4, 1980, 582/80
Int. Cl.³ C07J *9/00*
U.S. Cl. 260—397.1 12 Claims

1. A $\Delta^{1,4,17}$-BNC compound having the formula:



wherein X is a substituent selected from the group consisting of OH and OCH_3.

4,333,881

PROCESS FOR REDUCING METAL ALKOXIDES, AND THE USE OF THE COMPOUNDS SO OBTAINED

Alberto Greco, Dresano, and Guglielmo Bertolini, Pavia, both of Italy, assignors to Anic S.p.A., Palermo and Snamprogetti S.p.A., Milan, both of, Italy

Filed Feb. 25, 1980, Ser. No. 124,148
Claims priority, application Italy, Mar. 7, 1979, 20798 A/79
Int. Cl.³ C07F *9/00, 7/28, 7/00, 11/00*
U.S. Cl. 260—429 R 4 Claims

1. A process for reducing alkoxides of transition metals selected from the group consisting of Ti (4+), V (4+), V (5+), Cr (4+), and Zr (4+), to the corresponding alkoxides of lower valency, consisting essentially of reacting at least one member of said alkoxides of said metals in the liquid phase with the vapours of at least one metal selected from the group consisting of alkaline earth, group III and group IV metals, and manganese.

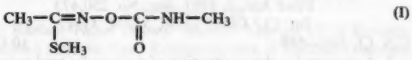
4,333,882

PROCESS FOR PREPARING N-METHYLCARBAMATE OF METHYLTHIOACETALDOXIME

Stefano Campolmi, Novara; Vittorio Carletti, Meda, and Marcello Marchi, Novara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

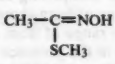
Filed Feb. 17, 1981, Ser. No. 234,842
Claims priority, application Italy, Feb. 18, 1980, 19979 A/80
Int. Cl.³ C07C *119/18*
U.S. Cl. 260—453.3 9 Claims

1. A process for preparing N-methylcarbamate of methylthioacetaldoxime of formula



(I)

characterized in that an aqueous suspension of methylthioacetaldoxime of formula



(II)

is additioned, in one step only, with gaseous phosgene and aqueous methylamine in the presence of an aqueous inorganic alkaline base, substantially at room temperature and pressure, and at a pH maintained constant around a value between 8 and 12.

4,333,883

PREPARATION OF N-CHLOROTHIO(METHYL)CARBAMOYL HALIDES

Stephen J. Nelson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jul. 6, 1981, Ser. No. 280,638
Int. Cl.³ C07C *51/62, 125/03*
U.S. Cl. 260—544 C 11 Claims

1. A process for preparing a N-chlorothio(methyl)carbamoyl halide which comprises (a) reacting N-methylcarbamoyl halide with an excess of sulfur dichloride in the presence of a tertiary organic base to form a mixture containing N-chlorothio(methyl)carbamoyl halide and sulfur monochloride; (b) chlorinating the mixture obtained in (a) to obtain a product containing N-chlorothio(methyl)carbamoyl halide and sulfur dichloride and (c) subjecting the product obtained in (b) to distillation.

4,333,884

PRODUCTION OF ACETIC ANHYDRIDE

Hans-Klaus Kübbeler, Swisttal; Heinz Erpenbach, Cologne; Klaus Gehrmann, and Klaus Schmitz, both of Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 29, 1980, Ser. No. 191,702

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1979, 2939839

Int. Cl.[3] C07C *51/56, 51/54, 53/12*

U.S. Cl. 260—546 7 Claims

1. In a process for making acetic anhydride by reacting methyl acetate and/or dimethylether with carbon monoxide under practically anhydrous conditions, at temperatures of 350 to 575 K., under pressures of 1 to 300 bars, and in the presence of a catalyst system containing noble metals belonging to group VIII of the periodic system of the elements, or compounds thereof, iodine and/or its compounds, and an aliphatic carboxylic acid having 1 to 8 carbon atoms, the improvement which comprises: effecting the reaction in the presence of a catalyst system containing, as additional ingredients, a heterocyclic aromatic compound, in which at least one hetero atom is a quaternary nitrogen atom, or a quaternary organophosphorus compound, and a zirconium compound being soluble in the reaction mixture; said heterocyclic compound or organophosphorus compound being in the form of its addition product with acetic acid or methyl iodide and having a melting point or mixed melting point of less than 413 K., which is the boiling point of acetic anhydride.

4,333,885

METHOD FOR PRODUCING CARBOXYLIC ACID ANHYDRIDE

David Feitler, Whitehall, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 2, 1981, Ser. No. 250,473

Int. Cl.[3] C07C *51/56, 51/54, 53/12*

U.S. Cl. 260—549 10 Claims

1. A process for the production of carboxylic acid anhydride from carboxylic acid ester and synthesis gas comprising reacting a feed gas mixture of hydrogen and carbon monoxide in which the volume percent hydrogen ranges from about 33% to about 80% with a liquid reactant mixture comprising carboxylic acid ester at a temperature in the range of from about 125° C. to about 250° C. and a pressure in the range of from about 5 atmospheres to about 100 atmospheres in the presence of an iodide promoted catalyst containing a noble metal of the eighth subgroup of the periodic table and a side-reaction-inhibiting amount of a carboxylic acid inhibitor having an acyl moiety corresponding to the acyl moiety of said carboxylic acid ester.

4,333,886

CARBURETOR

Tomiyoshi Mitsui, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

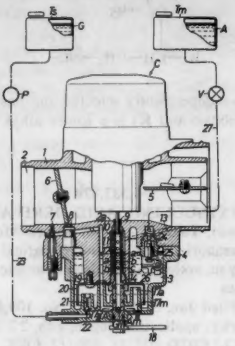
Filed Mar. 27, 1981, Ser. No. 248,302

Claims priority, application Japan, Mar. 31, 1980, 55-41616

Int. Cl.[3] F02M *13/06*

U.S. Cl. 261—18 R 4 Claims

1. A carburetor comprising: an intake passage, a main nozzle opening to said intake passage, a fixed support cylinder having a peripheral wall formed therethrough with a plurality of apertures, said peripheral wall being surrounded by an annular chamber communicating with said intake passage upstream of said main nozzle, a float chamber for storing fuel, an air bleed pipe rotatably fitted in said fixed support cylinder and communicating with said main nozzle and said float chamber, said air bleed pipe having a peripheral wall formed therethrough with a plurality of groups of air bleed ports of different air-bleeding characteristics, said groups of air bleed ports being selectively placed into communication with said apertures in said fixed support cylinder in accordance with the turning movement of said air bleed pipe relative to said fixed support cylinder, a changeover valve operatively connected with said air bleed pipe for integral rotation therewith and adapted to be operated



from the outside for changing the degree of communication between said air bleed pipe and said float chamber.

4,333,887

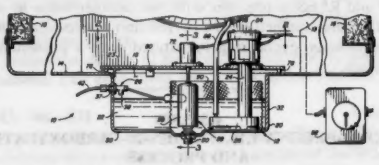
AUTOMATIC FLUSHING AND DRAINING APPARATUS FOR EVAPORATIVE COOLERS

Adam D. Goettl, 4960 E. Palomino Dr., Phoenix, Ariz. 85018

Continuation-in-part of Ser. No. 222,552, Jan. 5, 1981, Pat. No. 4,289,713, which is a continuation-in-part of Ser. No. 115,041, Jan. 24, 1980, Pat. No. 4,255,361, which is a continuation-in-part of Ser. No. 7,027, Jan. 29, 1979, Pat. No. 4,192,832. This application Aug. 27, 1981, Ser. No. 296,775

Int. Cl.[3] B01F *3/04*

U.S. Cl. 261—27 17 Claims



1. An automatic flushing and draining apparatus for an evaporative cooler comprising:

(a) an evaporative cooler including a sump means in the bottom thereof for containing a water supply used in operation of said evaporative cooler;

(b) shutoff valve means for supplying water from an external source to the sump means of said evaporative cooler and maintaining it at a predetermined operating level;

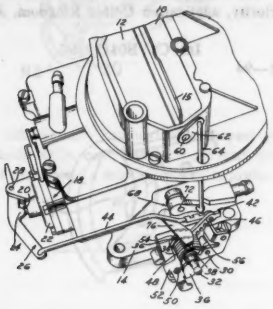
(c) a siphon drain valve mounted in the sump means of said evaporative cooler and having a water inlet adjacent its lower end and a water passage zone at its upper end, said siphon drain valve being vertically movable between an upwardly extended position wherein its water passage zone is located above the operating water level in the sump means of said evaporative cooler and a downwardly disposed position wherein its water passage zone is located below the operating water level in the sump means of said evaporative cooler; and

(d) means coupled to said siphon drain valve and having a first state wherein said siphon drain valve is in its axially upwardly extended position and a second state which moves said siphon drain valve to its axially downwardly disposed position for priming thereof.

4,333,888
CARBURETOR ACCELERATOR PUMP STROKE CONTROL

David A. Onofrio, Riverview, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 31, 1980, Ser. No. 174,072
Int. Cl.³ F02M 7/08
U.S. Cl. 261—34 B 4 Claims



1. A stroke control for the accelerator pump of a carburetor having an induction passage, the flow therethrough being controlled by both a throttle valve and a thermostatically responsive choke valve spaced from one another in the passage and each rotatably mounted for movement across the passage, the accelerator pump having a fuel pumping control linkage operatively connected to the throttle valve for actuation of the pump through a normal full stroke upon a predetermined opening movement of the throttle valve,

the stroke control including a cam mounted for movement at times into engagement with a portion of the linkage to restrict the movement of the linkage to provide a less than normal stroke of the pump, and means operatively connecting the cam to the choke valve for effecting a movement of the cam in response to movement of the choke valve,

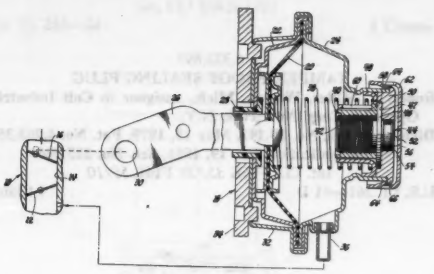
the linkage including a fuel pumping lever movable through a normal stroke to provide a full actuation of the pump, the throttle valve and a throttle lever being secured on a shaft, an accelerator pump overtravel lever rotatably mounted on the shaft and connected to the fuel pumping lever for movement thereof, overtravel spring means surrounding the shaft with opposite ends of the spring interconnecting the overtravel lever and throttle lever permitting relative movement between the two, a stop in the path of movement of the overtravel lever to limit and define the normal stroke of the overtravel lever and the fuel pumping lever, and a further lever secured to the overtravel lever and projecting into alignment with the cam to be engaged thereby at times when the cam is moved a predetermined amount by the choke valve to prevent the overtravel lever from moving into engagement with the stop and thereby decreasing the stroke of the fuel pumping lever.

4,333,889
CARBURETOR VACUUM BREAK ASSEMBLY

Myron Faryna, and Kerry A. Morphet, both of Rochester, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 10, 1981, Ser. No. 252,842
Int. Cl.³ F02M 1/14
U.S. Cl. 261—39 B 1 Claim

1. A carburetor vacuum break assembly including a housing, a diaphragm secured in said housing and having a center section adapted to travel to and from a retracted position in response to variations in pressure in said housing, and a stop having a portion engaging said diaphragm in said retracted position, and wherein said stop comprises a screw member having a neck received in a bore in said housing, a radially extending flange trapped against axial movement in a radially extending recess in said housing, and a threaded stem projecting toward said diaphragm, a seal engaged between the neck of said screw member and said housing to prevent leakage about said screw member, and a bushing threaded on the stem of said

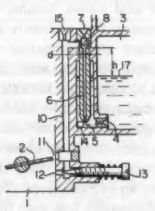


screw member, said bushing having a tab extending radially into an axially extending recess formed in said housing whereby said bushing is trapped against rotary motion and is constrained to move axially upon rotation of said screw member, said bushing constituting said portion of said stop engaging said diaphragm in said retracted position, the position of said bushing being adjustable by rotation of said screw member to thereby establish said retracted position.

4,333,890
SLOW FUEL CONTROLLING DEVICE FOR CARBURETOR

Kimiji Karino; Tadao Osawa; Masami Nagano, all of Katsuta; Tokihiko Sakuma; Yuiti Kanazawa, both of Hitachi; Tunemitu Kuroha, Tokaimura, and Kanji Tachibana, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 29, 1980, Ser. No. 144,921
Claims priority, application Japan, May 9, 1979, 54/57210
Int. Cl.³ F02M 3/08
U.S. Cl. 261—41 D 5 Claims



1. A carburetor having a slow fuel system which comprises;

(1) a mixing chamber,

(2) metering means for metering flow of the fuel introduced from a fuel float chamber,

(3) a fuel passage for introducing the fuel metered by said metering means into said mixing chamber,

(4) a slow air bleed passage for introducing air into said mixing chamber,

(5) a mixture passage for introducing the air-fuel mixture mixed in said mixing chamber into an intake passage,

wherein said fuel passage and said slow air bleed passage are arranged to mix air and fuel in said mixing chamber in the form of counter flows, and the diameter of said fuel passage is selected to substantially fill said fuel passage with the fuel by utilizing capillary action, and wherein the

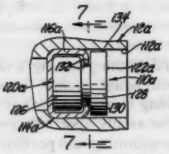
diameter of said metering means is smaller than the diameter of said fuel passage.

4,333,891

TAMPER PROOF SEALING PLUG

Robert J. Miller, Warren, Mich., assignor to Colt Industries Operating Corp, New York, N.Y.

Division of Ser. No. 39,192, May 15, 1979, Pat. No. 4,283,353. This application Jan. 19, 1981, Ser. No. 225,986
Int. Cl.³ F16K *35/00*; F16L *55/10*
U.S. Cl. 261—41 D 7 Claims



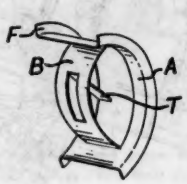
1. A fuel metering system effective for metering the rate of fuel flow to an associated combustion engine, comprising body means, conduit means formed in said body means communicating with a source of fuel, orifice means formed generally in said body means for receiving fuel from said conduit means and discharging said fuel into induction passage means associated with said engine, an opening formed in said body means, said opening receiving adjustably positionable valve means, said valve means being selectively adjustably positionable with respect to said orifice means in order to thereby cooperate with said orifice means in order to cooperatingly define an effective metering area for metering said rate of said fuel flow from said conduit means and to said induction passage means, and closure means received in said opening as to effectively close said opening to access to said valve means, said closure means comprising retainer means, and a closure member operatively retained by said retainer means against withdrawal of said closure member from said opening, said closure member being rotatable with respect to said body means, said retainer means comprising a cup-like caging member having a generally transverse end wall and a generally cylindrical wall joined thereto and terminating in an open end, said closure member comprising a first closure member body portion and a second closure member body portion, an intermediate closure member body portion of transverse dimension less than that of either said first or second closure member body portions and operatively joining said first and second closure member body portions, said cylindrical wall of said cup-like caging member being formed generally radially inwardly as to define a flange-like portion having a second opening in said open end, said intermediate closure member body portion being generally received within said second opening, said first closure member body portion being contained within said cup-like caging member, and said second closure member body portion being situated externally of said cup-like caging member, said first closure member body portion being of a dimension precluding withdrawal of said first closure member body portion through said second opening, and said second closure member body portion being of a dimension precluding insertion into said cup-like caging member through said second opening of said cup-like caging member.

4,333,892

DUMPED PACKINGS AND APPARATUS COMPRISING SUCH DUMPED PACKINGS

Stephen R. M. Ellis, Surby, Near Port Erin, Isle of Man, and Ronald Priestley, Kings Heath, England, assignors to Citten Limited, England

Continuation-in-part of Ser. No. 824,206, Aug. 12, 1977, abandoned, which is a continuation of Ser. No. 653,006, Jan. 28, 1976, abandoned. This application Aug. 17, 1979, Ser. No. 67,395
Claims priority, application United Kingdom, Jan. 29, 1975, 3943/75
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—94 11 Claims



1. A dumped random packing for use in gas/liquid contact apparatus consisting of a plurality of packing elements each comprising: an elongate polygonal or curved trough-shaped base member having free ends and longitudinally extending from one free end to the other around a first notional axis to an extent of about 90° to about 270° to define a space which is at least partially enclosed by said base member, said base member having one or more elongated apertures for gas/liquid flow through said base member; and at least one bridging member carried by said base member extending about a second notional axis parallel to the first notional axis and in the opposite sense to the base member, at least partially through said space, said trough-shaped base member having side walls on the edges of said base member defining spaced, parallel liquid distribution channels, one near each edge of and extending longitudinally of said base member, and forming spacing members extending transversely of said first notional axis outwardly of said base member, said bridging member having an aperture and a projecting tag which extends into said space from at least one edge of said aperture, the combination of said free ended, apertured base member and bridging member integral therewith providing an open structure of low resistance to gas flow through said element and the trough-shape providing a structure which aids liquid distribution and provides strength to resist collapse of said element under compressive stresses in said dumped random packing.

4,333,893

HIGH AREA CONTACTOR

Robert A. Clyde, Alfred University, P.O. Box 486, Alfred, N.Y. 14802

Filed Jan. 23, 1980, Ser. No. 114,637
Int. Cl.³ F02M *17/28*
U.S. Cl. 261—94 21 Claims

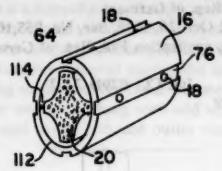
1. A tough and abrasive resistant high-area fluid contactor element comprising:

a high-area inner sponge member having a network of randomly located inter-connected closely adjacent filaments which define a plurality of inter-connecting cavities and which present a torturous flow path; and

a tough, rigid, and abrasive resistant substantially cylindrical shaped outer member surrounding said inner member to protect said inner member from abrasion and impact, said outer member having a first selected length and a first and further end.

16. A tough and abrasive resistant fluid contactor element comprising a tough and abrasive resistant substantially cylin-

drically shaped member having a longitudinal axis, and wherein a cross-section perpendicular to said longitudinal axis



through said substantially cylindrically shaped member has inside and outside walls, each of which are scalloped having a multiplicity of crests and a multiplicity of troughs.

4,333,894

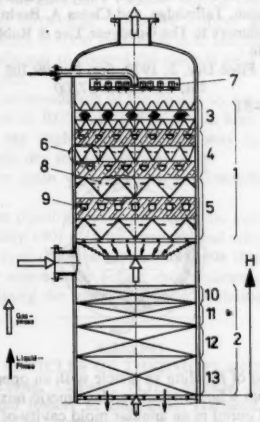
MASS-TRANSFER COLUMN

Klaus Hoppe, Magdeburg; Jürgen Müller; Jürgen Keller, both of Karl-Marx-Stadt; Bernd Kulbe, Leipzig; Klaus Lessig, Grimma; Christian Berlin, Grimma, and Eckhard Danke, Grimma, all of German Democratic Rep., assignors to Veb Chemieanlagenbaukombinat Leipzig-Grimma, Grimma, German Democratic Rep.

Filed Jan. 10, 1980, Ser. No. 110,853

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—96 **3 Claims**



1. Mass-transfer column for liquid-vapor contact processes, provided with packed tower internals and consisting of one or a plurality of a contact zone(s), wherein every contact zone is subdivided into immediately contiguous packed tower internals, characterized by the entire packed tower internals of one contact zone (**1**) containing a plurality, but a minimum of, three immediately contiguous horizontal packings (**3**; **4**; **5**) of varying geometry but identical basic structural configuration, said varying geometry having influence upon the vapor and liquid loading capacity of such a gradation that the free-flow sectional area is adapted to the load, thereby operating in the optimal load range of each of said packings.

4,333,895

APPARATUS FOR MOULDING MAGNET COMPACTS

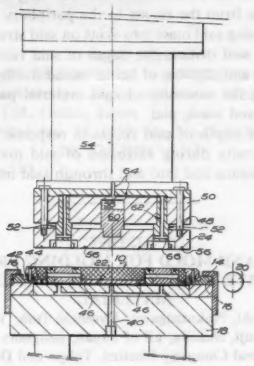
Kenneth H. Strawson, and Gerald Spencer, both of Sheffield, England, assignors to National Research Development Corp., London, England

Filed May 31, 1978, Ser. No. 911,104

Claims priority, application United Kingdom, Aug. 1, 1977, 32260/77

Int. Cl.³ B06B *1/02*

U.S. Cl. 264—24 **5 Claims**



1. A method of producing molded magnet compacts from a compactable slurry containing ferrite particles comprising the steps of providing a mold having fixable die plates and a mass of material having a high magnetic conductivity and a predetermined configuration and disposition relative to said die plates, fixing said plates relative to each other to define a die cavity of predetermined configuration and fixed volume, filling said die cavity with said slurry under a hydraulic pressure sufficient to compact said slurry therein, producing an induced electro-magnetic field through said die plates said field being transverse to the press axis of the mold, whereby said induced magnetic field passes non-linearly through said die cavity so that in cooperation with said mass, the ferrite particles within the slurry are oriented in a predetermined polar direction.

4,333,896

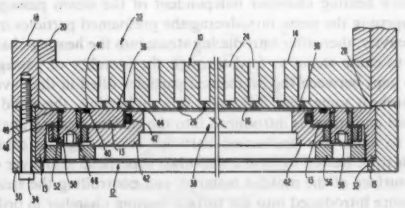
METHOD AND APPARATUS FOR EXTRUDING HONEYCOMB STRUCTURES WITH SKINS THEREON INVOLVING THE USE OF AN ADJUSTABLE EXTENSION DIE MASK

George M. Cunningham, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 12, 1980, Ser. No. 148,791

Int. Cl.³ B28B *21/54*; B28C *7/16*; B29F *3/04*

U.S. Cl. 264—40.5 **11 Claims**



1. A method of extruding honeycomb structures with skins thereon and comprising the steps of:

extruding material through a die means having an inlet face

and an outlet face and a plurality of passageways for said material extending therebetween so as to form honeycomb structures thereform;

passing said structures emanating from the passageways of the central portion of said outlet face through an orifice in a mask adjacent a peripheral portion of said outlet face, simultaneously passing said structures or a separate portion of said material from the passageways of the peripheral portion of said outlet face into a recess between said mask and said outlet face, compacting such structures or material in the recess into a skin-forming mass, delivering said mass from the recess to the periphery of said orifice and forming said mass into skins on said structures passing through said orifice, the depth of said recess being controllable and capable of being varied during extrusion;

monitoring the viscosity of said material passing through said die and mask; and

varying the depth of said recess in response to changes in said viscosity during extrusion of said material through the die means and into and through said mask.

4,333,897

METHOD AND MOLD FOR MOLDING PREFOAMED PARTICULATE THERMOPLASTIC SYNTHETIC RESIN MATERIAL

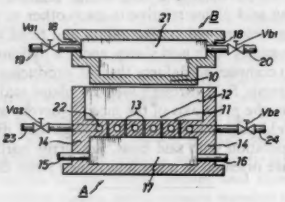
Tatsuo Hayashi, Nakatsugawa; Ryouichi Itoh, Yokkaichi, and Tatsumi Tsuji, Suzuka, all of Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo and Daisen Industry Company Limited, Saitana, both of, Japan

Filed Jul. 16, 1979, Ser. No. 57,569

Claims priority, application Japan, Jul. 18, 1978, 53-86684

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—40.6 **6 Claims**



1. A method for molding prefoamed particles of thermoplastic synthetic resin in a mold comprising opposed mold parts defining when closed a cavity and each of which parts have internal and external walls facing and not facing, respectively, the cavity, one or both of the mold parts having a heating chamber with steam inlet and outlet on an external wall, and one or both of the mold parts having a plurality of uniformly distributed steam passages in its internal wall leading from the cavity to the heating chamber, said internal wall having a surface heating chamber independent of the steam passages, comprising the steps: introducing the prefoamed particles into the cavity, thereafter introducing steam into the heating chamber to cause steam to feed through the plurality of passages into gaps between the prefoamed particles filled in the cavity to preheat same, and following this preheating, the mold is closed and steam is introduced into the surface heating chamber to cause the prefoamed particles contacting the cavity walls to be heated to form a smoothed superficial skin layer on the surface of the molded material, and controlling the steam pressure introduced into the surface heating chamber in order to control over a continuous range the superficial temperature of the prefoamed material and thereby control over a continuous range the thickness of the superficial skin layer on the surface of the prefoamed material.

4,333,898

METHOD OF MAKING A FOAMED PLASTIC

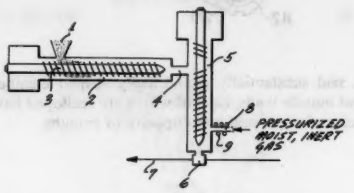
Hans-Martin Schmidtchen, Osnabrück, Fed. Rep. of Germany, assignor to Kabel und Metallwerke Gutehoffnungshutte A.G., Hanover, Fed. Rep. of Germany

Filed Oct. 26, 1978, Ser. No. 955,101

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1977, 2713181

Int. Cl.³ B29D *7/02*

U.S. Cl. 264—45.9 **9 Claims**



1. In a method of making a cellular, polymeric product, wherein a silane compound is grafted upon a thermoplastic or elastomeric material to permit crosslinking in the presence of moisture, after the grafting-on of the silane, the grafted material being in a fluid state, the improvement of introducing into the grafted material from the outside pressurized, moist gas as a foaming agent, subsequent to grafting, while the grafted material is still in the fluid state, for obtaining and producing cells in the material, the cell walls being exposed to the moisture in the gas and begin crosslinking, and immediately thereafter shaping the material into the desired product.

4,333,899

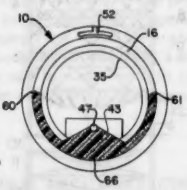
METHOD AND APPARATUS FOR MOLDING A TIRE

James M. Hogan, Tallmadge, and Cletus A. Becht, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 3, 1979, Ser. No. 99,705

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—51 **15 Claims**



1. A method of molding an article with an opening through the article from a liquid reactive elastomeric mixture adapted to be cast and cured in an annular mold cavity of a rigid mold tilted relative to the horizontal so that said mold will have an upper edge portion and a lower edge portion, and having an inlet opening provided in said mold adjacent said lower edge portion, comprising injecting the reactive mixture through said inlet openings into the mold cavity whereby it flows in different directions around an inner mold portion along an inner mold surface of said cavity providing at least two leading surface portions of said flowing mixture, joining said leading surface portions to form an interface portion in said mold cavity, ejecting said interface portion from said mold cavity through an outlet vent provided in said mold at a location adjacent said upper edge portion of said mold where said leading surface portions meet, curing said reactive mixture to form an elastomeric material, removing said article from said

mold and severing said interface portion ejected through said outlet vent from said mold cavity to provide a substantially uniform molded article of elastomeric material.

2. The method of claim 1 wherein said liquid reactive elastomeric mixture is a foamable liquid reactive elastomeric mixture to form a microcellular product and is injected into said mold cavity until said cavity is at least partially full and continuing to cure said reactive material during the foaming process so that the leading surfaces of the foam will meet at said interface portion and air and gases along with said interface portion are ejected from said cavity into said outlet vent.

4,333,900

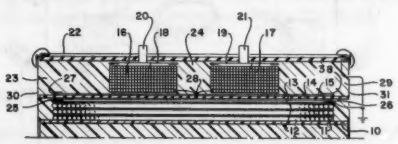
PROCESS FOR MANUFACTURE OF HIGH VOLTAGE TRANSFORMERS AND THE LIKE

James J. Carey, Henrietta, N.Y., assignor to Chloride Electro Networks, Division of Chloride, Inc., N. American Operation, Tampa, Fla.

Continuation of Ser. No. 856,998, Dec. 2, 1977, abandoned. This application Oct. 1, 1979, Ser. No. 80,208

Int. Cl.³ H02K *15/12*

U.S. Cl. 264—85 **3 Claims**



1. A process for making and encapsulating a transformer insulation system comprising:

forming the system with ultra-clean components to obtain a system that is free from impurities;

positioning ultrasonically cleaned porous fiber material as filler and ultra-clean oxide-free copper shields having folded edges to form radii ends near selected portions of the transformer to control the electric field and minimize corona; and

processing encapsulation of the system by vacuum baking it in an oven at 100° C. to 155° C. for at least four hours to remove any slight impurities that may be present and completely dry the transformer, then

flooding the oven with nitrogen to atmospheric pressure, and

capping the transformers off in hermetic containers at approximately 140° C. with nitrogen and allowing them to cool to room temperature for storage in this low pressure nitrogen atmosphere before encapsulation, and vacuum encapsulating the transformer and insulation system.

4,333,901

MOLDING ARTICLES OF THERMOPLASTIC RUBBER

Gerald T. Young, Conway, N.H.; Michael R. Easterling, Windsor, and Robert E. Dukeshire, Hartland, both of Vt., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 16, 1980, Ser. No. 150,474

Int. Cl.³ B29F *1/00*

U.S. Cl. 264—85 **8 Claims**

1. A method for providing a relatively smooth surface to an injection molded article of thermoplastic rubber comprising:

(a) providing a source of relatively moisture-free pressurized gas and a cold mold that when closed defines a sealed mold cavity;

(b) pressurizing the mold cavity with the relatively moisture-free gas prior to and during low pressure and speed injection of molten thermoplastic rubber into the mold cavity, the pressure of the gas being at least 50 pounds per square inch gauge but less than the pressure of the molten thermoplastic rubber as it is injected into the mold cavity;

(c) maintaining said gas pressurization while injecting molten thermoplastic rubber into said mold cavity;

(d) terminating the source of said gas pressurization about 1 to 2 seconds prior to completion of filling of the mold cavity with thermoplastic rubber;

(e) completing filling of the mold cavity with thermoplastic rubber; and

(f) allowing the thermoplastic rubber to solidify, then opening the mold and removing the thermoplastic rubber article from the mold cavity.

4,333,902

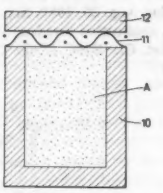
PROCESS OF PRODUCING A SINTERED COMPACT

Akio Hara, Nishinomiya, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 24, 1977, Ser. No. 762,189

Int. Cl.³ B29C *1/02*

U.S. Cl. 264—320 **12 Claims**



1. Process of producing a sintered compact comprising:

filling a cup with a powdered material to be sintered;

putting on an opening of the cup a covering member consisting of a lid and solder so as to permit ventilation between the interior and exterior of the cup to form a cup assembly;

applying heat as well as vacuum to the cup assembly to degas the powdered material;

melting the solder by the continuation of heat to air-tightly seal the cup with the lid to obtain a closed cup compressible under high pressure at high temperature while maintaining the air-tight seal; and

hot-pressing the closed cup to obtain a sintered compact.

4,333,903

ROW OF CONTINUOUS SLIDE FASTENER COUPLING ELEMENTS AND METHOD OF MAKING THE SAME

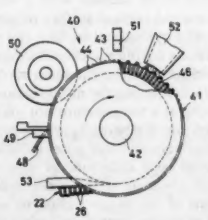
Hiroshi Yoshida, Kurobe; Isao Hagiwara, Namerikawa, and Shigeyuki Oodera, Kurobe, all of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jan. 31, 1979, Ser. No. 8,102

Claims priority, application Japan, Jan. 31, 1978, 53/9461

Int. Cl.³ A44B *19/12;* **B29C** *25/00*

U.S. Cl. 264—165 **7 Claims**



1. A method of manufacturing a row of continuous slide fastener coupling elements, comprising the steps of:

(a) transporting and bending a monolfilament of thermosplastic synthetic resin successively into a plurality of continuous turns each including a coupling head, a pair of spaced legs extending from said coupling head, and a connector located remotely from said coupling head and extending between one of said legs and a leg of an adjacent coupling element; and

(b) substantially during said bending, permanently heat-setting only each said connector at least at a surface layer thereof which faces away from said coupling head at a temperature slightly below the melting point of the monofilament, and while said turns are still being transported, providing said turns a temporary heat-set at a relatively low temperature, whereby the temporarily heat-set coupling heads are stabilized in pitch by the permanently heat-set connectors.

4,333,904

FORMING A MOUTHPIECE ON A PREFORM

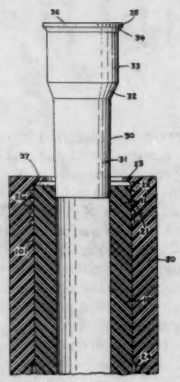
Kjell M. Jakobsen, Skanör, Sweden, assignor to PLM AB, Malmo, Sweden

Continuation of Ser. No. 15,961, Feb. 28, 1979, abandoned. This application Aug. 28, 1980, Ser. No. 182,086

Claims priority, application Sweden, Mar. 2, 1978, 7802362

Int. Cl.³ B29C *17/00, 17/07*

U.S. Cl. 264—323 **9 Claims**



1. In a process for forming a mouthpiece on a preform formed from a tubular blank of thermoplastic material, adapted for the production of a container, the mouthpiece being formed with connecting means on the outer surface thereof by inserting the blank between an outer mold section having a mold portion for the formation of the connecting means and an inner mold section, the two mold sections being moved relatively axially to force the material of the inserted blank to move radially outwards into the mold portion for the connecting means of the outer mold section, an improvement comprising forming the inner mold section with a first conical surface merging with a second conical surface of greater cone angle in turn merging with a cylindrical surface, the relative movement of said mold sections during molding resulting in axial advance of the inner mold section into the outer mold section with the first conical surface entering the mold section first, the material of said blank being at a temperature not greater than the glass transition temperature and being squeezed between said first and second conical surfaces and said outer mold section to undergo radial compression and deformation into the mold portion during said axial advance of the inner mold section for the connecting means of the outer section to secure the blank to said outer mold section whereupon the second conical section displaces the material in the inner region of the blank axially in the direction of insertion of the inner mold section to reduce the thickness of the mouthpiece in relation to the remainder of the blank while the blank undergoes overall lengthening at its end remote from the mouthpiece and said mouthpiece of the blank is elongated and flows axially in opposite direction to fill the mold when the first mold section is fully inserted into the second mold section, the penetration of said first conical section into said blank during axial advance of said second conical section into said blank preventing displaced material from entering the internal cavity of the blank.

4,333,905

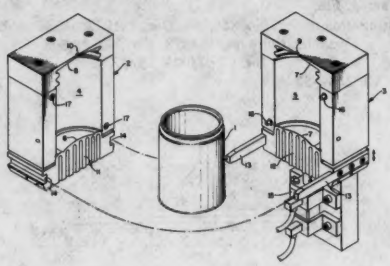
METHOD FOR BLOWMOLDING A CONTAINER

Borge Hestehave, Alta Loma, and Kjeld Hestehave, Upland, both of Calif., assignors to Bomatic, Inc., Ontario, Calif.

Filed Oct. 15, 1980, Ser. No. 197,151

Int. Cl.³ B29C *17/07*

U.S. Cl. 264—529 **12 Claims**



1. A method for the blow molding of a plastic container with a thickened bead at the bottom thereof comprising the steps of:

(a) extruding a tubular parison between parts of a blow mold;

(b) closing said mold parts about said parison so as to define a molding cavity of a greater size than the intended finished size of said container;

(c) preblowing said parison within said molding cavity with a blowing medium under low pressure so as to partially inflate said parison to approximately 95% of said finizhed size has been inserted;

(d) raising a molding cavity bottom wall part of said blow mold so as to compact 2 double-wall thickness of said partially inflated parison in a manner forming a thickened bead in a circumferential bead forming recess between said bottom wall part and adjacent surrounding molding cavity parts;

(e) finish-blowing said parison within said molding cavity with a blowing medium under high pressure so as to inflate said parison to said intended finished size; and

(f) opening said mold parts for removal of said container.

4,333,906

PROCESS FOR PRODUCING HOLLOW FIBERS HAVING A NON-UNIFORM WALL THICKNESS AND A NON-UNIFORM CROSS-SECTIONAL AREA

Christopher H. Porter, Newtown Square, and John A. Taylor, Furlong, both of Pa., assignors to Extracorporeal Medical Specialties, Inc., King of Prussia, Pa.

Division of Ser. No. 19,973, Mar. 12, 1979, Pat. No. 4,288,494. This application Jul. 14, 1980, Ser. No. 167,891

Int. Cl.³ B29C *17/02*

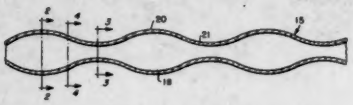
U.S. Cl. 264—40.3 **11 Claims**

1. A method for producing a regenerated cellulose hollow fiber having a hollow core extending continuously throughout the length thereof, said fiber having a non-uniform wall thickness and a non-uniform cross-sectional area, said method comprising

(a) providing a tube-in-orifice spinneret comprising a hous-

ing having a chamber communicating with an outer surface thereof and a hollow tube having a continuous lumen extending the length thereof secured within said chamber, the walls of said chamber and the outer surface of said tube defining an annular space through which a fiber forming material may be extruded;

(b) supplying to said chamber a fiber forming material selected from the group consisting of cuprammonium cellulose solution and viscose cellulose solution;



(c) extruding said fiber forming material through said annular space to form a hollow core extrudate;

(d) supplying a fluid at a constant mean flow rate to the lumen of said hollow tube while simultaneously varying the pressure on said supplied fluid;

(e) removing from the exit of said spinneret said extrudate with said fluid contained in the hollow core thereof; and

(f) converting said fiber forming material to fiber form.

4,333,907

BIAXIALLY ORIENTED WHOLLY AROMATIC POLYESTER FILM

Takanori Urasaki, Hino; Yasuji Hirabayashi, Hachioji; Makoto Ogasawara, and Hiroo Inata, both of Hino, all of Japan, assignors to Teitin Limited, Osaka, Japan

Filed Jun. 24, 1980, Ser. No. 162,576

Claims priority, application Japan, Jun. 25, 1979, 54-79050; Sep. 25, 1979, 54-121926; Sep. 25, 1979, 54-121927

Int. Cl.³ B29C *17/02;* **C08G** *63/02*

U.S. Cl. 264—290.2 **19 Claims**

1. A melt-molded film of a wholly aromatic polyester, said film having in its plane two perpendicularly crossing directions in each of which the Young's modulus and strength of the film at 25° C. are at least about 200 kg/mm² and at least about 5 kg/mm² respectively, the product of the Young's moduli of the film in the two directions being at least 8×10^4 (kg/mm²)², and said wholly aromatic polyester being substantially linear, having a melt viscosity at about its melting point of at least about 10000 poises, and being composed substantially of recurring units derived from p-hydroxybenzoic acid, recurring units derived from a m- or p-oriented aromatic dicarboxylic acid and recurring units derived from a m- or p-oriented aromatic dihydroxy compound, the proportion of said recurring units derived from p-hydroxybenzoic acid being about 30 to about 70 mole% based on the entire recurring units, the melt viscosity (η_a) of the film being defined by the following equation

$$\eta_a=\pi pr^4/8lQ \quad (1)$$

wherein η_a is the melt viscosity of a wholly aromatic polyester sample determined by packing about 1 g of a powder of the wholly aromatic polyester sample in a cylinder having a cross-sectional area of 1 cm² and equipped with a nozzle having a diameter of 1 mm and a length of 5 mm centrally at its bottom portion, extruding the polyester under pressure from the nozzle at about its melting point, and measuring the melt viscosity of the polyester when the shear rate (sec^{-1}) defined by the following equation (2)

$$\gamma_a=4Q/\pi r^3 \quad (2)$$

reaches 100 sec^{-1}; p is the pressure (dyne/cm²) applied; r is the radius (=0.05 cm) of the nozzle; l is the length (=0.5 cm) of the nozzle; and Q is the rate (cc/sec) of the polyester extruded.

4,333,908

KIT FOR DETERMINING SILICA-ALUMINA CATALYST IN FUEL OIL

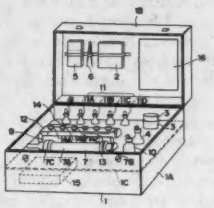
Hiroya Maki; Taketoshi Furusawa, and Takeo Takaishi, all of Nagasaki, Japan, assignors to Mitsubishi-Jukogyo Kabushiki Kaisha, Japan

Filed Dec. 29, 1980, Ser. No. 221,195

Claims priority, application Japan, Jan. 14, 1980, 55/1922[U]; Sep. 19, 1980, 55/132245[U]

Int. Cl.³ G01N *33/22, 1/00*

U.S. Cl. 422—61 **4 Claims**



1. An analytical kit for fuel oil to determine a silica-alumina catalyst component contained therein, which comprises a plurality of syringes for sampling fuel oil, sample containers for holding the sampled oil, an organic solvent for dissolving said oil in one of said containers, filter means for the solution of said oil in said organic solvent, a reagent for dissolving a catalyst component in the filtration residue formed by said filter means, a measuring cylinder to contain the solution formed by said reagent, purified water for diluting said solution in said cylinder to a predetermined volume, color-producing reagents to be added to said solution adjusted with said purified water, means for comparing the color developed by said color-producing reagents with colors of known standards, and a portable box accommodating all of said means and supplies.

4,333,909

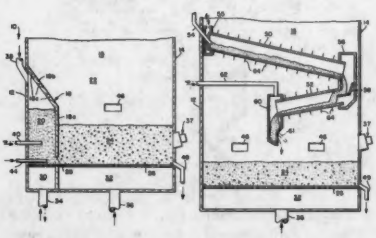
FLUIDIZED BED BOILER UTILIZING PRECALCINATION OF ACCEPTORS

Robert D. Stewart, Verona, and Robert L. Gamble, Wayne, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed May 9, 1980, Ser. No. 148,339

Int. Cl.³ F27B *15/08, 15/10, 15/14;* **B01J** *8/28*

U.S. Cl. 422—141 **15 Claims**



1. A fluidized bed boiler comprising a housing, grate means supported in said housing and adapted to receive a bed of particulate material at least a portion of which is fossil fuel, means for passing air through said grate means and said particulate material to fluidize said particulate material, first means for introducing into said housing a raw acceptor for the sulfur produced as a result of combustion of said fuel, means for confining a supply of said acceptor within an area that is iso-

lated from said bed of particulate material and in a heat transfer relation to the heat generated by said fluidized bed to calcine said acceptor, and second means for introducing said calcined acceptor into said bed, said second introducing means including means directing pressurized gas from the area within the confining means to the bed of particulate material to assist in moving the acceptor from said area to said bed.

9. A fluidized bed boiler comprising a housing, grate means supported in said housing and adapted to receive a bed of particulate material at least a portion of which is fossil fuel, means for passing air through said grate means and said particulate material to fluidize said particulate material, means for introducing into said housing a raw acceptor for the sulfur produced as a result of combustion of said fuel, means for confining said acceptor within an area that is isolated from said bed of particulate material and in a heat transfer relation to the heat generated by said fluidized bed to calcine said acceptor and for introducing said calcined acceptor into said bed, said confining and introducing means comprising at least one downwardly slanted, elongated distribution conduit positioned in a vertically stacked configuration within said housing above said fluidized bed, wherein said means for introducing said raw acceptor into said housing deposits said raw acceptor into the upper end of the uppermost of said at least one downwardly slanted distribution conduit and wherein the calcined acceptor passes from the lower end of the lowermost of said slanted elongated conduits onto said bed of particulate material.

4,333,910

ARRANGEMENT FOR DISCHARGING COKE FROM A COOLING SHAFT SUPPLIED WITH COOLING GAS

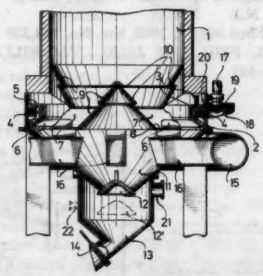
Johannes Lorrek, and Friedrich Jokisch, both of Essen, Fed. Rep. of Germany, assignors to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Jan. 14, 1981, Ser. No. 225,969

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1980, 3003345

Int. Cl.³ B01F *7/16*

U.S. Cl. 422—228 **23 Claims**



1. An arrangement for discharging coke from a cooling shaft supplied with cooling gas and having an outlet region, the arrangement comprising housing means arranged to be located adjacent to the outlet region of the cooling shaft and sealed from atmosphere; a supporting element accomodated rotatable in said housing means; at least one coke stripping member also accommodated in said housing means and arranged to engage in a mass of coke discharged from the cooling shaft, said coke stripping member being mounted on said supporting element for joint rotation therewith; and means for rotating said supporting element together with said coke stripping member.

4,333,911

METHOD OF PREPARING A SOLUTION OF GALLIUM 68 FROM GERMANIUM 68

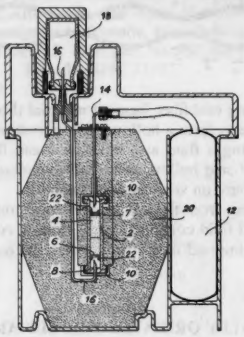
Dominique Comar, Bures sur Yvette; Christian Loc'h, Rosny sous Bois, and Bernard Maziere, Gif-sur-Yvette, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 23, 1980, Ser. No. 143,106

Claims priority, application France, Apr. 24, 1979, 79 10361

Int. Cl.³ C01G *15/00*; A61K *43/00*

U.S. Cl. 423—2 **5 Claims**



1. A method of preparing a solution of gallium 68 from germanium 68, wherein the germanium 68 is fixed on particles of tin dioxide and the gallium 68 produced by radioactive decay of the germanium 68 fixed on said particles is then eluted with a solution of hydrochloric acid.

4,333,912

METHOD FOR DISSOLVING PLUTONIUM-CONTAINING NUCLEAR FUELS

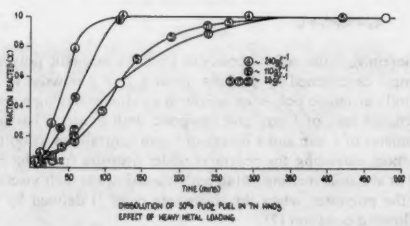
Alfred L. Mills, Thurso; Laurence R. Weatherley, Cairneyhill, both of Scotland, and John A. Crofts, Dursley, England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Apr. 22, 1980, Ser. No. 142,736

Claims priority, application United Kingdom, Apr. 30, 1979, 7914978; Nov. 7, 1979, 7938498

Int. Cl.³ B01F *1/00*; C01G *43/02*

U.S. Cl. 423—20 **3 Claims**



1. A method of increasing the dissolution rate in nitric acid of plutonium dioxide and uranium/plutonium oxide fuels and insoluble residues therefrom comprising conducting said dissolution in at least 7 molar nitric acid having metal loadings of Pu or U+Pu maintained at at least 200 g per liter of nitric acid.

4,333,913

METHOD OF PURIFYING AQUEOUS SOLUTIONS OF METAL HYDROXIDES

Ronald L. Dotson, and Edward P. Carr, both of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 965,818, Dec. 4, 1978, Pat. No. 4,260,494. This application Aug. 18, 1980, Ser. No. 179,147

The portion of the term of this patent subsequent to Apr. 7, 1998, has been disclaimed.

Int. Cl.³ C01D *1/36*

U.S. Cl. 423—184 14 Claims

1. A process for purifying an aqueous solution of an alkali metal hydroxide containing a soluble polysulfide complex of mercury and having an alkali metal hydroxide concentration in the range from about 25 to about 75% by weight, which comprises:

(a) heating said solution to a temperature of at least 25° C.,

(b) reacting an inorganic peroxide with said solution to precipitate solid particles of an oxide of said mercury in said solution, and

(c) separating said solid particles from said solution.

4,333,914

METHOD FOR MAKING ALUMINUM TRIMETAPHOSPHATES FROM POWDER REACTANTS

James E. Neely, Jr., Butler; Chia-Cheng Lin, Gibsonia; Charlene A. Falleroni, Lower Burrell, and Annette Moff, Latrobe, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 26, 1980, Ser. No. 210,509

Int. Cl.³ C01B *25/36*

U.S. Cl. 423—314 6 Claims

1. A method for making aluminum trimetaphosphate comprising a mixture of chain form polyphosphate species comprising the steps of:

a. mixing thoroughly in approximately stoichiometric quantities

(1) an aluminum hydroxide compound and

(2) a phosphate compound capable of reacting with the aluminum hydroxide compound to form aluminum trimetaphosphate; and

b. heating the mixture at a sufficient temperature for a sufficient time to convert the reactants to a product which comprises a mixture of chain form polyphosphate species of aluminum trimetaphosphate.

4,333,915

PROCESS FOR PRODUCING METALLIC CARBONITRIDE

Tadashi Iwai; Takashi Kawahito, and Masahiro Tokuse, all of Ube, Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan

Filed Mar. 31, 1981, Ser. No. 249,353

Claims priority, application Japan, Jun. 20, 1980, 55-82867

Int. Cl.³ C01B *33/00;* C01C *3/08;* C04B *35/56, 35/58*

U.S. Cl. 423—324 15 Claims

1. A process for producing a metallic carbonitride said metal being selected from the group consisting of Groups IV, V and VI of the Periodic Table of Elements, comprising the step of calcining a precursor obtained by (i) reacting the reaction product of ammonia and the halide of a metal with at least one member selected from the group consisting of carbohydrates and polyvinyl alcohols, or (ii) the reaction product of the halide of a metal and at least one member selected from the group consisting of carbohydrates and polyvinyl alcohols with ammonia.

4,333,916

PROCESS FOR PRODUCING CARBONITRIDE OF METAL

Tadashi Iwai; Takashi Kawahito, and Masahiro Tokuse, all of Ube, Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan

Filed Mar. 30, 1981, Ser. No. 248,823

Claims priority, application Japan, Apr. 18, 1980, 55-50355

Int. Cl.³ C01C *3/08;* C04B *35/56, 35/58*

U.S. Cl. 423—371 11 Claims

1. A process for producing the carbonitride of a metal comprising the step of calcining a precursor obtained by (i) reacting the reaction product of ammonia and the halide of a metal selected from the group consisting of Groups IV, V and VI of the Periodic Table of Elements with polyphenol, or (ii) reacting the reaction product of polyphenol and the halide of a metal selected from the group consisting of Groups IV, V and VI of the Periodic Table of Elements with ammonia, the amount of the polyphenol being within the range defined by the following relationship:

$$0 < \frac{a \times b}{c} < 3$$

wherein a is the number of hydroxyl groups contained in one molecule of the polyphenol, b is the number of moles of the polyphenol and c is the number of moles of the metallic halide.

4,333,917

PROCESS OF PRODUCING SULFURIC ACID

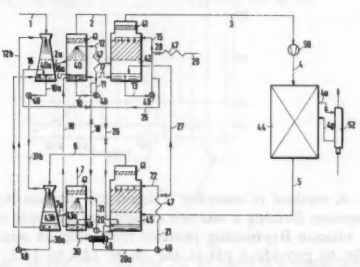
Karl H. Dörr, Mainz; Helmut Diekmann, Karben; Hugo Grimm, Miltenberg; Ulrich Sander, Friedrichsdorf; Michael Tacke, and Waldemar Weber, both of Offenbach, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 7, 1980, Ser. No. 119,289

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1979, 2905083

Int. Cl.³ C01B *17/74, 17/98, 17/48;* B01D *3/00*

U.S. Cl. 423—522 8 Claims



1. In a process for producing sulfuric acid from SO_2-containing gases containing more water than required for sulfuric acid production comprising forming SO_3 by a catalytic reaction and absorbing the SO_3 in concentrated sulfuric acid, in which process the SO_2-containing gas is purified and cooled, the cooled gases containing more water than required for concentrated sulfuric acid production, at least part of the SO_2-containing gas which as been purified and cooled is predried in contact with dilute sulfuric acid in a preliminary drying stage, the SO_2-containing gas is finally dried with concentrated sulfuric acid, dilute acid from the final dryer is returned to an SO_3 absorbing step and dilute sulfuric acid which has been used for predrying is strengthened in a strengthening stage in direct contact with water absorbing gases and is returned to the preliminary drying stage, the improvement wherein:

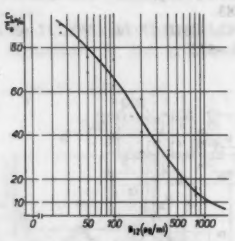
(a) dilute sulfuric acid having a concentration of 30 to 70 percent by weight is used in the preliminary drying stage:
(b) a partial stream of dilute sulfuric acid is withdrawn from the preliminary drying stage and in said strengthening stage is strengthened in direct contact with water-absorbing gases and is then returned to the preliminary drying stage at a concentration which is 2 to 40% by weight higher than the concentration of the dilute sulfuric acid in the preliminary drying stage;
(c) the partial stream of dilute sulfuric acid is circulated in said strengthening stage of step (b) and is heated therein by an indirect heat exchange;
(d) the dilute sulfuric acid circulating in the preliminary drying stage is cooled by an indirect heat exchange;
(e) the temperature of the SO_2-containing gas leaving the preliminary drying stage is maintained as high as or higher than the temperature of the gases entering the preliminary drying stage;
(f) removing more water in the preliminary drying stage than is required to maintain a water balance between the final drying step and the SO_3 absorbing step, a portion of the dilute acid from the preliminary drying stage is supplied to the SO_3 absorbing step to maintain the water balance in the overall plant; and
(g) sufficient sulfuric acid is supplied from the SO_3 absorbing step to the preliminary drying stage to compensate for the dilute acid supplied from the preliminary drying stage to the SO_3 absorbing stage.

4,333,918

RADIOASSAY FOR VITAMIN B_{12}

James A. Carney, London, England, and Adrienne R. McGregor, East Malvern, Australia, assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Mar. 23, 1979, Ser. No. 969,624
Int. Cl.³ G01N *33/54, 33/56;* G01T *1/00*
U.S. Cl. 424—1 **13 Claims**



1. A method of assaying a liquid for vitamin B_{12}, which comprises: forming a mixture comprising a sample of the liquid, vitamin B_{12}-binding proteins from chicken serum, and a buffer to provide a pH in the range 12.8 to 13.2, whereby vitamin B_{12} in the mixture becomes bound to the said binding proteins; and then measuring the amount of vitamin B_{12} present in the sample by analysis of a component of the mixture.

4,333,919

GROWTH PROMOTANT CONTROLLED RELEASE FORMULATIONS AND METHOD OF TREATMENT

John W. Kleber, and Barbara E. Simpson, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 74,682, Sep. 12, 1979, abandoned. This application Dec. 15, 1980, Ser. No. 216,404
Int. Cl.³ A61K *9/22, 9/26*
U.S. Cl. 424—15 **24 Claims**

1. A biodegradable controlled release formulation useful in promoting growth and feed utilization in ruminant animals comprising from about 20 to about 80 percent by weight of a growth promoting and feed utilization enhancing agent intimately dispersed throughout a copolymer derived from about 60 to about 95 percent by weight of lactic acid and about 40 to about 5 percent by weight of glycolic acid, said copolymer having an inherent viscosity of about 0.08 to about 0.30 when measured in chloroform, said copolymer having a molecular weight of about 6000 to about 35000 and being substantially free of polymerization catalyst, said formulation being in combination with suitable excipients and carriers therefor.

4,333,920

BENZALPHTHALIDES AND BROAD SPECTRUM SUN SCREENS

Donald E. Conner, Clifton, N.J., assignor to Van Dyk & Company, Inc., Belleville, N.J.

Continuation-in-part of Ser. No. 14,598, Feb. 23, 1979, abandoned. This application May 24, 1979, Ser. No. 42,013
Int. Cl.³ A61K *7/42*
U.S. Cl. 424—59 **18 Claims**

1. A composition adapted for application to the human skin comprising a cosmetic oil carrier containing distributed therein from an effective amount to provide substantial protection against erythemal and tanning radiation up to the limit of solubility therein of a benzalphthalide.

4,333,921

HAIR CLEANSING CONDITIONER WITH LATHERING ACTION

Oscar B. Luedicke, Butler; Thad Domzalski, Pompton Lakes, and David Zajac, East Brunswick, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 2, 1980, Ser. No. 193,217
Int. Cl.³ A61K *7/06*
U.S. Cl. 424—70 **3 Claims**

1. An aqueous hair conditioning composition consisting essentially of from about 1 to 2 percent by weight of an alkyl (C_{12} to C_{20}) dimethylbenzylammonium chloride compound, from about 3 to 5 percent by weight of an alkyl (C_{10} to C_{18}) dimethylamine oxide compound, and about 0.5 percent of an aqueous pearlescent hair conditioning composition comprising glycolamido stearate, said composition having a pH in the range of about 4–6.

4,333,922

METHOD FOR THE TREATMENT OF WATER-LIVING ANIMALS WITH HEALTH MODIFYING AGENTS

Robert J. Herschler, 3080 NW. 8th St., Camas, Wash. 98607

Continuation-in-part of Ser. No. 505,396, Sep. 12, 1974, abandoned. This application Feb. 11, 1976, Ser. No. 657,228
Int. Cl.³ A61K *39/12, 31/14, 31/17*
U.S. Cl. 424—89 **28 Claims**

1. A method of enhancing the penetration into and across an epithelial membrane barrier of a water-living animal of a health modifying agent capable of eliciting a desired health modifying effect therefrom comprising contacting the water-living animal with a sufficient amount of an aqueous solution or dispersion of the health modifying agent to produce the desired health modifying effect on the water-living animal and a solution comprising a sufficient concentration of a second agent selected from the group consisting of acetamide, urea, sodium chloride and mixtures thereof to enhance penetration and systemic uptake of the health modifying agent to achieve the desired health modifying effect.

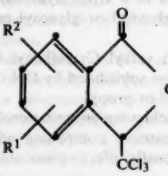
4,333,923

METHOD FOR IMPROVING THE EFFICIENCY OF RUMINANT FEED UTILIZATION

James R. Beck, Indianapolis, and Joseph A. Yahner, Clinton, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 26, 1981, Ser. No. 247,673
Int. Cl.³ A61K *35/00, 37/00, 31/335*
U.S. Cl. 424—115 14 Claims

1. A method of increasing the efficiency of feed utilization by ruminant animals having a developed rumen function which comprises the oral administration to such animals of a propionate-increasing amount or a methane-inhibiting amount of a compound having the formula



wherein: R^1 and R^2 independently are hydrogen, hydroxy, C_1–C_3alkoxy, or C_1–C_3alkyl.

7. The method of claim 1 wherein the phthalide is administered in combination with a polyether or glycopeptide feed efficiency enhancing agent.

8. The method of claim 7 wherein the phthalide is administered in combination with monensin.

4,333,924

RETINOL ACETATE SKIN-CARE COMPOSITIONS

Inez Bowley, Dorking, and Raymond G. Harrison, Reigate, both of England, assignors to Beecham Group Limited, England

Continuation of Ser. No. 933,489, Aug. 14, 1978, abandoned. This application Mar. 25, 1980, Ser. No. 133,810
Int. Cl.³ A61K *31/00, 31/215, 47/00*
U.S. Cl. 424—170 6 Claims

1. A skin care composition comprising an oil-in-water emulsion base comprising about 30% by weight of an oil selected form the group consisting of mineral oil and mineral oil in combination with lanolin and decyl oleate, a non-ionic emulsifying agent in an amount from 2 to 12% by weight and retinol acetate in an amount from 1,000 to 15,000 IUg—1.

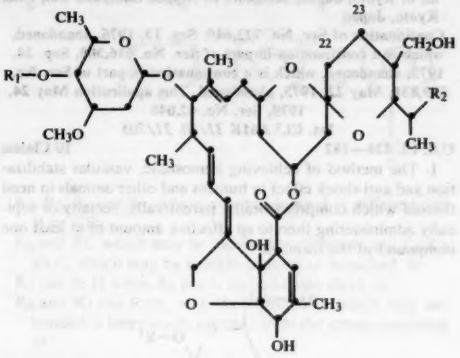
4,333,925

DERIVATIVES OF C-076 COMPOUNDS

Rudolf P. Buhs, Short Hills; Theodore A. Jacob, Westfield; Gerald Miwa, Maplewood; Elena Sestokas, Rahway; Rae Taub, Metuchen, and John S. Walsh, Avenel, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

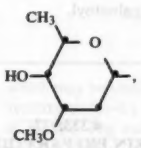
Filed May 11, 1981, Ser. No. 262,082
Int. Cl.³ A61K *31/71;* C07H *17/08*
U.S. Cl. 424—181 8 Claims

1. A compound having the formula:

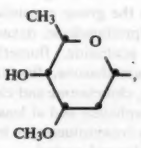


wherein R_1, R_2 and the 22, 23 broken line have the following meanings:

In Compound I, R_1 is

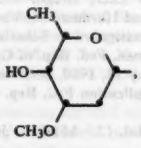


R_2 is $—CH_2CH_3$, and the 22, 23 bond is a double bond; in Compound II, R_1 is —H, R_2 is $—CH_2CH_3$, and the 22, 23 bond is a single bond; in Compound III, R_1 is



R_2 is $—CH_2CH_3$, and the 22, 23 bond is a single bond; in Compound IV, R_1 is —H, R_2 is $—CH_3$, and the 22, 23 bond is a single bond; or in

Compound V, R_1 is



R_2 is $—CH_3$ and the 22, 23 bond is a single bond.

4,333,926
STERYL-β-D-GLUCOSIDE PHARMACEUTICAL COMPOSITIONS AND USE

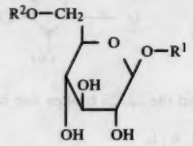
Katsuya Ohata; Tadatoshi Nomura, and Masayoshi Watanabe, all of Kyoto, Japan, assignors to Nippon Shinyaku Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 722,649, Sep. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 616,308, Sep. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 579,831, May 22, 1975, abandoned. This application May 24, 1979, Ser. No. 42,048

Int. Cl.³ A61K *31/70, 31/705*

U.S. Cl. 424—182 **10 Claims**

1. The method of achieving hemostatic, vascular stabilization and anti-shock effect in humans and other animals in need thereof which comprises orally, parenterally, rectally or topically administering thereto an effective amount of at least one compound of the formula:



wherein

R^1 is β-sitosteryl, campesteryl, stigmasteryl or cholesteryl; and

R^2 is hydrogen or palmitoyl.

4,333,927
SKIN PREPARATION

Kunihiko Ofuchi, Yokohama; Koichiro Oda, Tokyo, and Kenichiro Nakao, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed Mar. 13, 1981, Ser. No. 243,430

Claims priority, application Japan, Mar. 27, 1980, 55-39450

Int. Cl.³ A61K *31/58;* **A01N** *45/00*

U.S. Cl. 424—238 **23 Claims**

1. A skin preparation containing at least one topical corticosteroid selected from the group consisting of hydrocortisone, prednisolone, methylprednisolone, dexamethasone, triamsinolone, triamsinolone acetonide, flumethasone, fluocinonide, beclomethasone, betamethasone, fluocinolone, fluoromethalone, fludroxycortide, clobetasone and clobetasol, and an effective amount of a phosphatide and at least one of butylhydroxyanisole and butylhydroxytoluene to impart stability to the preparation for a prolonged period.

4,333,928
16 α-ALKYL STEROIDS, THEIR PREPARATION, AND PHARMACEUTICAL PREPARATIONS THEREOF

Günter Neef; Ulrich Eder; Gregor Haffer; Gerhard Sauer; Rudolf Wiechert, and Hermann Steinbeck, all of Berlin, Fed. Rep. of Germany, assignors to Schering, Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

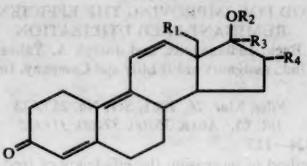
Filed May 16, 1980, Ser. No. 150,518

Claims priority, application Fed. Rep. of Germany, May 17, 1979, 2920184

Int. Cl.³ A61K *31/56*

U.S. Cl. 424—243 **14 Claims**

1. A 16α-alkyl steroid of the formula



wherein

R_1 is hydrogen or methyl,

R_2 is hydrogen, C_{1-5} alkyl, C_{3-5} cycloalkyl, C_{1-5} alkyl or C_{3-5} cycloalkyl interrupted by 0 at a nonterminal position, the acyl residue of a C_{1-17} hydrocarbon carboxylic or sulfonic acid, glycosyl or glycosyl esterified by a C_{1-5} alkanoyl,

R_3 is hydrogen, C_{1-5} alkyl, C_{2-3} alkenyl, C_{2-3} alkynyl or one of the latter three substituted by OH or halo, and

R_4 is methyl, ethyl or propyl.

14. A method of achieving progestational effects in a patient in need of such treatment comprising administering to the patient a progestationally effective amount of a compound of claim 1.

4,333,929
CARBOXAMIDINE DERIVATIVES AND HYPOGLYCEMICAL USE

Barrie C. C. Cantello, Redhill, England, assignor to Beecham Group Limited, England

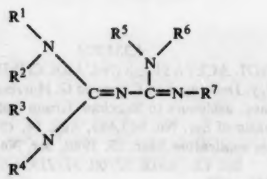
Filed Jan. 19, 1981, Ser. No. 226,180

Claims priority, application United Kingdom, Jan. 22, 1980, 8002132

Int. Cl.³ A61K *31/155, 31/54;* **C07C** *129/00;* **C07D** *279/10*

U.S. Cl. 424—246 **13 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof wherein

each of R^1, R^2, R^3 and R^4 independently of the others is alkyl of 1 to 6 carbon atoms;

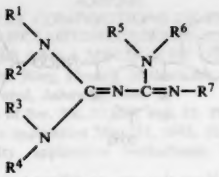
R^5 when taken independently of R^6 is hydrogen or alkyl of 1 to 6 carbon atoms;

R^6, when taken independently of R^5 is alkyl of 1 to 6 carbon atoms, phenyl or benzyl, said phenyl and benzyl being unsubstituted or substituted with from 1 to 3 members selected from the group consisting of halo, alkyl of 1 to 6 carbon atoms and alkoxy of 1 to 6 carbon atoms; or

R^5 and R^6 together with the nitrogen to which they are attached are a 5 to 6 membered heterocyclic ring containing said nitrogen as the sole hetero atom or containing a member selected from the group consisting of nitrogen, oxygen or sulfur as a second hetero atom; and

R^7 phenyl or benzyl, said phenyl and benzyl being unsubstituted or substituted with from 1 to 3 members selected from the group consisting of halo, alkyl of 1 to 6 carbon atoms and alkoxy of 1 to 6 carbon atoms.

8. The method of effecting a hypoglycemic response in an animal in need thereof which comprises administering thereto an effective amount of a compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof wherein

each of R^1, R^2, R^3 and R^4 independently of the others is alkyl of 1 to 6 carbon atoms;

R^5 when taken independently of R^6 is hydrogen or alkyl of 1 to 6 carbon atoms;

R^6, when taken independently of R^5 is alkyl of 1 to 6 carbon atoms, phenyl or benzyl, said phenyl and benzyl being unsubstituted or substituted with from 1 to 3 members selected from the group consisting of halo, alkyl of 1 to 6 carbon atoms and alkoxy of 1 to 6 carbon atoms; or

R^5 and R^6 together with the nitrogen to which they are attached are a 5 to 6 membered heterocyclic ring containing said nitrogen as the sole hetero atom or containing a member selected from the group consisting of nitrogen, oxygen or sulfur as a second hetero atom; and

R^7 is alkyl of 1 to 6 carbon atoms, phenyl or benzyl, said phenyl and benzyl being unsubstituted or substituted with from 1 to 3 members selected from the group consisting of halo, alkyl of 1 to 6 carbon atoms and alkoxy of 1 to 6 carbon atoms.

4,333,930

ORTHOARYLIDENEAMINOPHENETHYLAMINES AND PHARMACEUTICAL COMPOSITIONS

Marie-Helene Creuzet, Bordeaux; Claude Feniou, Pessac; Francoise Guichard, Bordeaux, and Gisele Prat, Talence, all of France, assignors to Laboratoires Sarget, Merignac, France

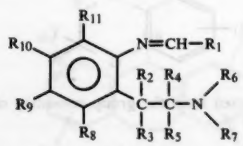
Filed Feb. 23, 1981, Ser. No. 237,277

Claims priority, application France, Feb. 21, 1980, 80 03774

Int. Cl.³ A61K *31/535, 31/36;* **C07D** *413/06, 317/58*

U.S. Cl. 424—248.51 **7 Claims**

1. A compound of the formula

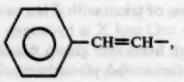


(I)

wherein

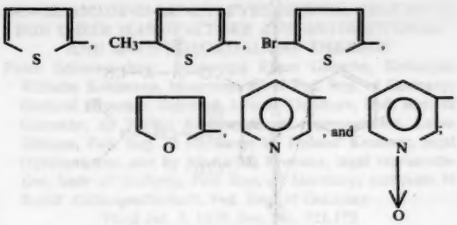
R_1 is phenyl which is unsubstituted or substituted by at least one member selected from the group consisting of halogen, CF_3, C_1–C_4 alkyl, C_1–C_4 alkoxy and COOH, or

R_1 is



or

R_1 is a heterocycle selected from the group consisting of

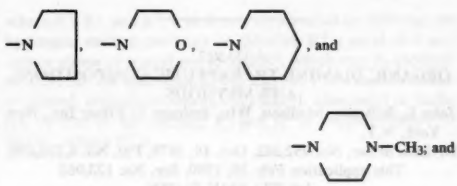


R_2, R_3, R_4 and R_5, which may be identical or different, are H or CH_3;

R_6 and R_7, which may be identical or different, are C_1–C_6 alkyl, which may be straight-chained or branched, or

R_7 can be H when R_6 is a branched-chain alkyl, or

R_6 and R_7 can form, with the nitrogen to which they are bonded, a heterocycle selected from the group consisting of



R_8, R_9, R_{10} and R_{11}, which may be identical or different, are H, halogen, CF_3, hydroxy or C_1–C_4 alkoxy, or two contiguous members of R_8, R_9, R_{10} and R_{11} may together form a chain —O—$(CH_2)_n$—O—, where n=1 or 2, or a chain —O—CH_2—O—CH_2—;

or a pharmaceutically acceptable addition salt thereof.

5. A composition exhibiting central nervous system activity comprising

in an amount effective to exhibit central nervous system activity the compound according to claim 1 or 2, and

a pharmaceutically acceptable diluent or carrier.

4,333,931

METHOD OF COMBATTING HARMFUL MICROORGANISMS USING QUINOXALINE COMPOUNDS

Wolfgang Schmid, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

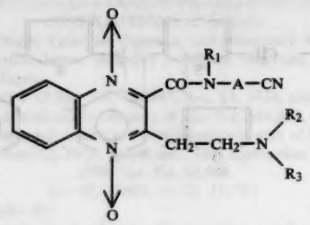
Division of Ser. No. 102,281, Dec. 10, 1979, Pat. No. 4,254,120. This application Dec. 29, 1980, Ser. No. 221,181

Claims priority, application Switzerland, Dec. 19, 1978, 12887/78; Jul. 5, 1979, 6295/79; Nov. 20, 1979, 10341/79

Int. Cl.³ A61K *31/535, 31/495*

U.S. Cl. 424—248.54 **7 Claims**

1. A method for combatting harmful microorganisms which comprises administering to an animal infested with said microorganisms a microbicidally effective amount of a compound of the formula



in which

R_1 is hydrogen or alkyl having 1 to 4 carbon atoms,

each of R_2 and R_3 is alkyl having 1 to 4 carbon atoms, or, together with the nitrogen atom to which they are attached, form a heterocyclic ring which is unsubstituted or substituted by alkyl having 1 to 4 carbon atoms and which has 4 or 5 ring carbon atoms and optionally an oxygen atom as a further hetero atom, and

A is alkyl having 1 to 4 carbon atoms, or an acid addition salt thereof.

4,333,932

ORGANIC DIAMINE THERAPEUTIC COMPOSITIONS AND METHODS

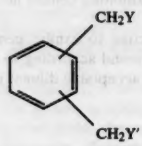
John L. Belletire, Madison, Wis., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 952,302, Oct. 18, 1978, Pat. No. 4,220,650. This application Feb. 20, 1980, Ser. No. 123,063

Int. Cl.³ A61K *31/535*

U.S. Cl. 424—248.56 **9 Claims**

7. A method for lowering blood sugar in the treatment of a diabetic host which comprising orally administering to said host an effective blood sugar lowering amount of a compound selected from the group consisting of organic diamine bases of the formula



and the pharmaceutically acceptable acid addition and quarternary ammonium salts thereof wherein Y is selected from the group consisting of pyridylamino, piperidino and morpholine and Y′ is 2,3-dihydroisoindolyl.

9. The method as claimed in claim 7 wherein the compound administered is 2,3-dihydro-2-[2-(4-morpholinomethyl)phenylmethyl]-1H-isoindole.

4,333,933

BENZOGUANAMINE DERIVATIVES, THEIR PRODUCTION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME

Shingo Matsumura; Hiroshi Enomoto; Yoshiaki Aoyagi, and Yoshihisa Shibata, all of Kyoto, Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

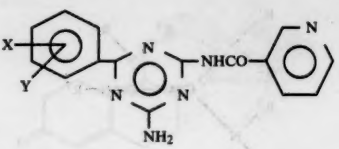
Filed May 22, 1981, Ser. No. 266,483

Claims priority, application Japan, Jun. 4, 1980, 55/75875

Int. Cl.³ C07D *251/48, 401/12;* A61K *31/44, 31/53*

U.S. Cl. 424—249 **20 Claims**

1. A nicotinoylbenzoguanamine derivative or an acid addition salt thereof of the formula (I):



in which X and Y are the same or different and each independently is hydrogen or halogen, but both X and Y are not simultaneously hydrogen.

4,333,934

IMIDAZOQUINOXALINES AND PYRROLOQUINOXALINES

Alan C. Barnes, and David A. Rowlands, both of Cirencester, England, assignors to Roussel Uclaf, Paris, France

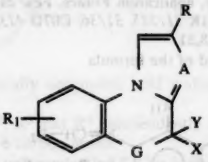
Filed Feb. 4, 1980, Ser. No. 118,445

Claims priority, application United Kingdom, Feb. 9, 1979, 7904648

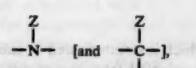
Int. Cl.³ C07D *241/42, 241/44, 487/04*

U.S. Cl. 424—250 **18 Claims**

1. A compound selected from the group consisting of compounds of the formula



wherein A is selected from the group consisting of nitrogen and =CH—, G is



Z is selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms or taken with Y forms a carbon-nitrogen bond, Y is hydrogen, or taken with Z is a carbon-nitrogen bond or taken with X is =O and X is hydrogen or taken with Y is =O, R is selected from the group consisting of hydroxymethyl, formyl, N-(tetrazol-5-yl)-carbamoyl, aminomethyl and carbamoyl, R_1 is selected from the group consisting of hydrogen, halogen and alkoxy of 1 to 5 carbon atoms and its nontoxic, pharmaceutically acceptable acid addition salts.

4,333,935

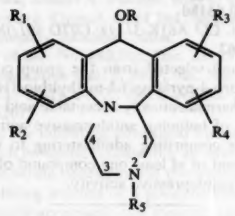
ANTIANXIETY COMPOSITIONS OF 10-HYDROXY 1,2,3,4,10,14b-HEXAHYDRODIBENZO[c,f]PYRAZINO-1,2a AZEPINES AND A METHOD OF USE THEREOF

Willem J. van der Burg, Heesch, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 77,693, Sep. 21, 1979, Pat. No. 4,284,559. This application Mar. 27, 1981, Ser. No. 248,113
Claims priority, application Netherlands, Sep. 26, 1978, 7809726
Int. Cl.³ A61K *31/495*; C07D *7/04*
U.S. Cl. 424—250 18 Claims

1. A pharmaceutical composition for treating anxiety in a patient, comprising:

(a) a pharmaceutically effective anxiety reducing amount of a compound of the formula:



or a pharmaceutically effective non-toxic salt thereof, wherein:

(a) R is hydrogen, alkyl of one to six carbons, aralkyl of seven to ten carbons, or carboxylic acyl group of one to six carbons;

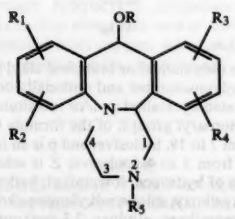
(b) R_1, R_2, R_3 and R_4 each represent hydrogen, hydroxy, halogen, alkyl of one to six carbons, alkoxy of one to six carbons, alkylthio of one to six carbons, or trifluromethyl; and

(c) R_5 represents hydrogen or an alkyl groups of one to six carbons; and

(B) a pharmaceutically effective carrier.

16. A method for treating anxiety in humans which comprises administering to a human

a pharmaceutically effective anxiety reducing amount of a compound of the formula:



or a pharmaceutically effective non-toxic salt thereof, wherein:

(a) R is hydrogen, alkyl of one to six carbons, aralkyl of seven to ten carbons, or a carboxylic acyl group of one to six carbons;

(b) R_1, R_2, R_3, and R_4 each represent hydrogen, hydroxy, halogen, alkyl of one to six carbons, alkoxy of one to six carbons, alkylthio of one to six carbons, or trifluromethyl; and

(c) R_5 represents hydrogen or an alkyl group of one to six carbons.

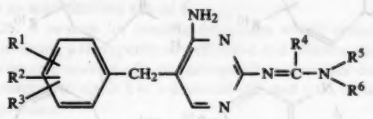
4,333,936

NOVEL AMIDINO-BENZYLPYRIMIDINES, PROCESSES FOR THEIR MANUFACTURE AND ANTIBACTERIAL AND ANTIPROTOZOAL USE THEREOF

Peter Scharwaechter, Moorrege; Klaus Gutsche, Rellingen; Wilhelm Kohlmann, Moorrege, all of Fed. Rep. of Germany; Gerhard Kroemer, deceased, late of Elmshorn, Fed. Rep. of Germany; by Norma Kroemer, legal representative, Lahn-Giessen, Fed. Rep. of Germany; by Helmut Kroemer, legal representative, and by Maria M. Kroemer, legal representative, both of Stolberg, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

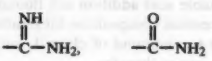
Filed Jul. 3, 1978, Ser. No. 921,175
Int. Cl.³ C07D *239/49, 403/12, 413/12*; A61K *31/505*
U.S. Cl. 424—251 25 Claims

1. An amidino-benzylpyrimidine of the formula I



(I)

where R^1, R^2, and R^3, which may be identical or different, are hydrogen, methyl, methoxy or chlorine, R^4 is alkyl of 1 to 6 carbon atoms or benzyl and R^5 and R^6, which may be identical or different, are hydrogen, lower alkyl of 1 to 4 carbon atoms, or phenyl, trimethoxybenzyl, cyclohexyl, adamantyl or furfuryl, or one of the radicals R^5 and R^6 is $-C_6H_4-SO_2-NH-R^7$, where R^7 is



or, pyrimidin-2-yl, 4-methyl-pyrimidin-2-yl, 5-methyl-pyrimidin-2-yl, 5-isopropyl-pyrimidin-2-yl, 5-methoxy-pyrimidin-2-yl, 6-methoxy-pyridazin-3-yl, 3-methoxy-pyrazin-2-yl, 5-methyl-isoxazol-3-yl or 2-pyridinyl, or R^5 and R^6 together with the nitrogen to which they are bonded are a saturated heterocyclic ring of 5–7 members containing one oxygen atom or one >N—Y group, where Y is methyl, benzyl or phenyl, and their pharmacologically acceptable salts with acids.

25. An antibacterial and antiprotozoal composition consisting essential of a pharmaceutically acceptable carrier or excipient and a therapeutically active amount of a compound of claim 1.

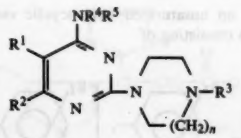
4,333,937

2-(PIPERAZINYL)-4-PYRIMIOINAMINES

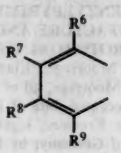
Sumanas Rakhit, Dollard des Ormeaux, and Jehan F. Bagli, Kirkland, both of Canada, assignors to American Home Products Corp., New York, N.Y.

Filed Apr. 18, 1980, Ser. No. 141,548
Int. Cl.³ A61K *31/505*
U.S. Cl. 424—251 18 Claims

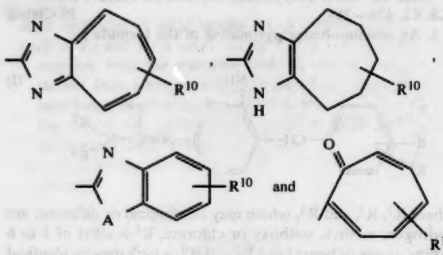
1. A compound of the formula



in which R^1 and R^2 are hydrogen, or R^1 and R^2 together form a chain of the formula



wherein R^6, R^7, R^8 and R^9 each is hydrogen or lower alkoxy; R^3 is selected from the group consisting of



wherein R^{10} is hydrogen, halo, lower alkyl, lower alkoxy, hydroxy, 1-oxo(lower)alkoxy or $NR^{11}R^{12}$ wherein R^{11} and R^{12} each is hydrogen or lower alkyl; A is O, S or NH; R^4 and R^5 each is hydrogen or lower alkyl; and n is 1 or 2; or a therapeutically acceptable acid addition salt thereof.

17. A pharmaceutical composition for treating hypertension, which comprises a compound of claim 1, and a pharmaceutically acceptable carrier therefor.

4,333,938

IMINO DERIVATIVES OF 5-AMINOBENZODIOXOLE-1,3 WHICH ARE USEFUL AS MEDICAMENTS

Marie-Helene Creuzet, Bordeaux; Claude Feniou, Pessac; Gisele Prat, Talence, and Henri Pontagnier, Pessac, all of France, assignors to Laboratoires Sarget, Merignac, France

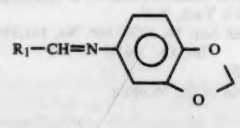
Filed Jun. 25, 1980, Ser. No. 162,814

Claims priority, application France, Jul. 16, 1979, 79 18357

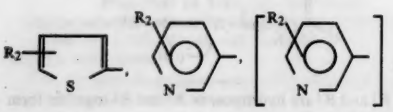
Int. Cl.³ C07D *405/12, 407/12*

U.S. Cl. 424—263 **12 Claims**

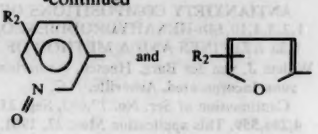
1. A compound of the general formula



wherein R_1 is an unsaturated heterocyclic radical selected from the group consisting of



-continued



wherein R_2 is H or one substituent selected from the group consisting of CH_3, halogen, and nitro.

4,333,939

TETRAHYDROPYRIDINYL-INDOLES

Jacques Guillaume, Sevran; Lucien Nedelec, Le Raincy, and Claude Dumont, Nogent-sur-Marne, all of France, assignors to Roussel Uclaf, Paris, France

Filed Jun. 30, 1980, Ser. No. 163,967

Claims priority, application France, Jul. 13, 1979, 79 18217; Mar. 7, 1980, 80 05180

Int. Cl.³ A61K *31/44;* C07D *401/04*

U.S. Cl. 424—263 **3 Claims**

1. A compound selected from the group consisting of 3-(1,2,3,6-tetrahydro-4-pyridinyl)-5-methylthio-1H-indole and its non-toxic, pharmaceutically acceptable acid addition salts.

3. A method of inducing antidepressive activity in warm-blooded animals comprising administering to warm-blooded animals an amount of at least one compound of claim 1 sufficient to induce antidepressive activity.

4,333,940

RING-FLUORINATED 4-(MONOSUBSTITUTED-AMINO) PHENYL COMPOUNDS IN INHIBITING ATHEROSCLEROTIC LESION DEVELOPMENT

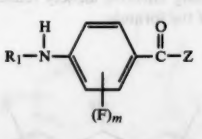
Robert G. Shepherd, South Nyack, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 874,433, Feb. 2, 1978, Pat. No. 4,243,609. This application Aug. 11, 1980, Ser. No. 176,958

Int. Cl.³ A01N *41/02, 43/42;* A61K *31/44, 31/255*

U.S. Cl. 424—263 **12 Claims**

1. The method of inhibiting atherosclerotic lesion development in a mammal comprising the administration of an effective lesion-development inhibiting amount of a compound of the formula:



wherein R_1 is an unbranched or branched alkyl group, optionally mono- or polyunsaturated and optionally containing saturated or unsaturated cycloalkyl and/or substituted or unsubstituted aryl or heteroaryl groups, of the formula $C_nH_{2n-(2p-1)}$, n is an integer from 7 to 19, inclusive, and p is an integer up to 6; m is an integer from 1 to 4, inclusive; Z is selected from the group consisting of hydrogen, loweralkyl, hydroxy, loweralkoxy, loweralkoxyalkoxy, diloweralkylaminoalkoxy, (mono- or polyhydroxy)loweralkoxy, allyloxy, 2,3-epoxypropoxy, substituted or unsubstituted benzyloxy, substituted or unsubstituted phenoxy and 3-pyridyloxy, pyridylmethoxy, (mono- or polycarboxy)loweralkoxy, (mono- or polycarboxy)hydroxyloweralkoxy, tetrahydropyranyloxy, (mono- or polyhydroxy)alkylamino, allylamino, propargylamino, 2-sulfoethylamino, (mono- or polycarboxy)loweralkylamino, (mono- or polycarboalkoxy)loweralkylamino, loweralkanoylamino, (substituted or unsubstituted aroyl)amino, loweralkanesulfonylamino, (substituted or unsubstituted arene)-sulfonylamino, loweralkanoylhydrazino, hydroxylamino, polymethyleneimino, 4-carboethoxy or 4-carboxythiazolidino, loweralkyl bearing one or

more carboxy, carboalkoxy, carbamoyl, acyl, sulfinyl, or sulfonyl groups; and wherein

may be replaced by carboxyloweralkyl, carboxyloweralkenyl, carboxyloweralkynyl, carboalkoxyloweralkyl, carboalkoxyloweralkenyl, carboalkoxyloweralkynyl, and the pharmacologically acceptable acid addition and cationic salts thereof to said mammal.

4,333,941
INHIBITION OF ENVELOPED VIRUSES WITH PHENYL KETONES

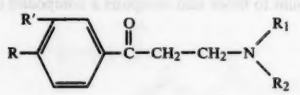
Brenda S. Baratz; Robert A. Phillips, both of Indianapolis, and David L. Steward, Carmel, all of Ind., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 643,585, Dec. 22, 1975, abandoned. This application Oct. 3, 1977, Ser. No. 839,056

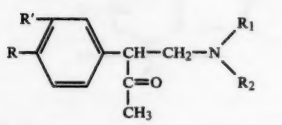
Int. Cl.[3] **H61K** *27/00;* **A61K** *31/445, 31/135*

U.S. Cl. 424—267 **26 Claims**

1. A method for inhibiting enveloped viruses on non-living substrates which comprises contacting an enveloped virus and a non-living substrate contaminated therewith, with an effective virus inhibiting amount of a phenylketone compound or pharmacologically-acceptable salt thereof, said phenylketone compound corresponding to one of the formulae:



I



II

wherein R represents hydrogen, halo, or alkoxy of from one to twelve carbon atoms, R' represents hydrogen or halo; R_1 and R_2 represent loweralkyl, or R_1 and R_2 taken together with the nitrogen atom represent a heterocyclic amino group or an N-alkyl quaternary heterocyclic ammonium group having four, five or six carbon atoms and zero or one additional ring hetero atom selected from oxygen, sulfur and nitrogen or R_1 and R_2, taken together with the nitrogen atom represent triloweralkylammonium.

4,333,942
ANTI-DEPRESSANT AND ANALGESIC 4-PHENOXYPIPERIDINES

Klaus Eistetter, Constance; Hans-Peter Kley, Allensbach; Heinz-Günter Menge, and Hartmann Schaefer, both of Constance, all of Fed. Rep. of Germany, assignors to BYK Gulden Lomberg Chemische Fabrik GmbH, Constance, Fed. Rep. of Germany

Filed Jul. 11, 1980, Ser. No. 167,628

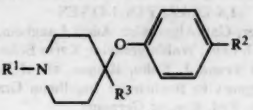
Claims priority, application Switzerland, Aug. 3, 1979, 7127/79

Int. Cl.[3] **A61K** *31/445;* **C07D** *211/52, 211/48*

U.S. Cl. 424—267 **28 Claims**

1. A compound selected from the group consisting of

(a) a 4-phenoxypiperidine of the formula



(I)

wherein

R_1 is —H, $C_{1\text{-}5}$ alkyl, $C_{3\text{-}5}$ alkenyl, cycloalkylmethyl with from 3 to 7 ring carbon atoms or phenylalkyl with from 1 to 3 carbon atoms in the alkyl,

R^2 is —H, —NO_2, amino or (carboxylic acid or carbonic acid acyl)amino and

R^3 is phenyl or benzyl,

(b) an N-oxide of (a) and

(c) an acid-addition salt of (a).

26. A process for treating depression which comprises administering a therapeutically-effective and pharmacologically-acceptable amount of a physiologically-acceptable compound according to claim **1** to a mammal afflicted with or subject to depression.

27. A process for treating pain which comprises administering an analgesically-effective and pharmacologically-acceptable amount of a physiologically-acceptable compound according to claim **1** to a mammal afflicted with pain.

4,333,943
ETHYL 3-(3-INDOLYL)-3-(5-TETRAZOLYL) PROPIONATE COMPOUNDS USED AS ANTI-HYPERTENSIVE AGENTS

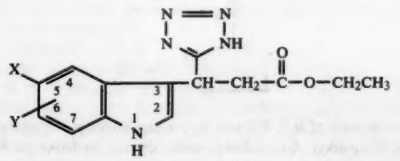
Elva Kurchacova, and Max E. Safdy, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation of Ser. No. 143,319, Apr. 24, 1980, abandoned. This application Dec. 15, 1980, Ser. No. 216,516

Int. Cl.[3] **A61K** *31/41;* **C07D** *257/04*

U.S. Cl. 424—269 **6 Claims**

1. A method for treating hypertension in an individual for whom such therapy is indicated which method comprises administering to the individual a therapeutically effective amount of an ethyl 3-(3-Indolyl)-3-(5-tetrazolyl) propionate of the formula:



wherein X is H or methoxy and Y is H, Cl or methoxy.

4,333,944

8-HALO-6-PHENYL-4H-S-TRIAZOLO (3,4-C) THIENO 1,4-DIAZEPIN-1-ONES

Karl-Heinz Weber, Gau-Algesheim; Adolf Langbein, Ingelheim am Rhein; Erich Lehr, Waldalgesheim; Karin Böke, Ingelheim am Rhein, and Franz J. Kuhn, Bingen, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 101,232, Dec. 7, 1979, abandoned, which is a continuation of Ser. No. 41,941, May 24, 1979, abandoned, which is a continuation of Ser. No. 881,851, Feb. 27, 1978, abandoned. This application Feb. 10, 1981, Ser. No. 233,294

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1977, 2708121

Int. Cl.³ A61K *31/55;* C07D *495/14*

U.S. Cl. 424—269 3 Claims

1. 8-Bromo-6-(o-chlorophenyl)-4H-s-triazolo[3,4-c]thieno[2,3-e]1,4-diazepin-1-one.

2. An amxyolytic, anticonvulsive or sedative pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective anxiolytic, anticonvulsive or sedative amount of the compound of claim 1.

4,333,945

THIAZOLINE AND IMIDAZOLINE DERIVATIVES USEFUL AS MINOR TRANQUILIZERS

Erwin Ringwald, Riehen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

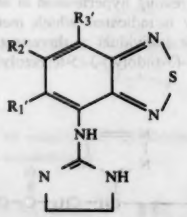
Continuation-in-part of Ser. No. 185,943, Sep. 10, 1980, abandoned, which is a continuation of Ser. No. 121,128, Feb. 13, 1980, abandoned. This application Dec. 3, 1980, Ser. No. 212,661

Claims priority, application United Kingdom, Feb. 16, 1979, 7905543; Feb. 16, 1979, 7905544

Int. Cl.³ A61K *31/425*

U.S. Cl. 424—270 4 Claims

1. A method of tranquilizing a neurotic subject which comprises administering to said subject a therapeutically effective amount of a compound of formula I' a



I'a

wherein each of R_1', R_2' and R_3', independently, is hydrogen, halo, C_{1-4} alkyl, C_{1-4} alkoxy, nitro, cyano, hydroxy or C_{1-4} alkylthio, said compound being in free base or in pharmaceutically acceptable acid addition salt form.

4,333,946

BLOCKING HISTAMINE H_2-RECEPTORS WITH IMIDAZOLYLALKYL GUANIDINE DERIVATIVES

Graham J. Durant; Charon R. Ganellin, both of Welwyn Garden City; Geoffrey R. Owen, High Wycombe, and Rodney C. Young, Bengeo, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

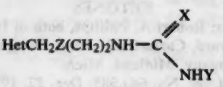
Division of Ser. No. 70,184, Aug. 27, 1979, Pat. No. 4,276,301, which is a division of Ser. No. 892,232, Mar. 31, 1978, Pat. No. 4,192,879, which is a division of Ser. No. 686,185, May 13, 1976, Pat. No. 4,098,898. This application Jan. 29, 1981, Ser. No. 229,435

Claims priority, application United Kingdom, May 21, 1975, 21817/75; Nov. 20, 1975, 47782/75

Int. Cl.³ A61K *31/415;* C07D *233/64, 233/68*

U.S. Cl. 424—273 R 8 Claims

1. A compound of the formula:



wherein X is N.CN; Y is di(lower alkyl)amino, lower alkoxy or phenylethyl; Z is sulphur or methylene; Het is an imidazole ring which is attached at a ring carbon and which ring is optionally substituted by lower alkyl, hydroxy, halogen or amino; provided that when Z is methylene, Y is not phenylethyl, or a pharmaceutically acceptable acid addition salt thereof.

8. A method of blocking histamine H_2-receptors which comprises administering to an animal in need thereof in an effective amount to block said receptors a compound of claim 1.

4,333,947

SUBSTITUTED IMIDAZOLES AND THEIR USE

Arto J. Karjalainen, and Kauko O. A. Kurkela, both of Oulu, Finland, assignors to Farmos-Yhtyma Oy, Turku, Finland

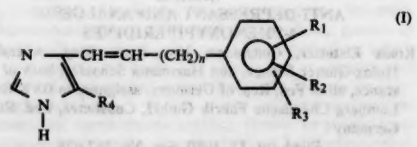
Filed Feb. 11, 1981, Ser. No. 233,305

Claims priority, application United Kingdom, Feb. 13, 1980, 8004748

Int. Cl.³ C07C *233/96*

U.S. Cl. 424—273 R 23 Claims

1. A substituted imidazole of the formula:



(I)

wherein each of R_1, R_2 and R_3, which can be the same or different, is hydrogen, chloro, bromo, fluoro, methyl, ethyl, methoxy, amino, hydroxy or nitro; R_4 is hydrogen or an alkyl radical of 1 to 7 carbon atoms; and n is an integer from 0–3, and its non-toxic pharmaceutically acceptable acid addition salts.

4,333,948

PHARMACEUTICAL FORMULATIONS CONTAINING PROSTAGLANDIN

Klaüs U. Weithmann, Eppstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 13, 1981, Ser. No. 243,443

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1980, 3010002

Int. Cl.[3] A61K *31/34, 31/215, 31/19*

U.S. Cl. 424—285 8 Claims

1. A pharmaceutical composition comprising an effective amount of a prostaglandin or prostaglandin derivative in admixture with a substance stabilizing prostaglandins, which substance is a blood serum fraction having a molecular weight below 2000 which is stable to alkalis, is unstable to acids, is stable to temperatures up to 100° C., and is non-volatile at room temperature.

4,333,949

1H-INDEN-1-ONE DERIVATIVES, THEIR USE IN MICROBICIDAL COMPOSITIONS, AND FOR COMBATING MICROORGANISMS

Elmar Sturm, Aesch, and Robert Nyfeler, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

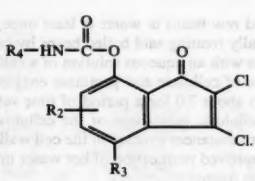
Division of Ser. No. 89,830, Oct. 31, 1979, Pat. No. 4,291,061. This application Jun. 5, 1981, Ser. No. 270,714

Claims priority, application Switzerland, Nov. 6, 1978, 11528/78

Int. Cl.[3] A01N *47/10;* C07C *125/04. 125/067*

U.S. Cl. 424—300 13 Claims

1. A 2,3-dichloro-7-carbamoyloxy-1H-inden-1-one derivative of the formula



wherein

R_2 and R_3 independently of one another are each hydrogen fluorine, chlorine, bromine, C_1–C_4-alkyl, trifluoromethyl or nitro, and

R_4 is hydrogen, C_1–C_6-alkyl or C_2–C_4-alkenyl, each of which is unsubstituted or substituted by halogen, or R_4 is phenyl which is unsubstituted or is substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, trifluoromethyl, cyano or nitro, or it is a C_3–C_6-cycloalkyl group.

7. A method for combatting microorganisms which comprises applying to said microorganisms or to the habitat thereof a pesticidally effective amount of a compound according to claim 1.

4,333,950

(+)-4-SUBSTITUTED-2-INDANOL INSECTICIDAL ESTER DERIVATIVES

John F. Engel, Medina, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

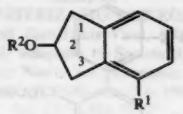
Continuation-in-part of Ser. No. 42,372, May 24, 1979, Pat. No. 4,263,319, which is a continuation of Ser. No. 927,198, Jul. 24, 1978, abandoned, said Ser. No. 870,973. This application Dec. 31, 1980, Ser. No. 221,656

The portion of the term of this patent subsequent to Apr. 21, 1998, has been disclaimed.

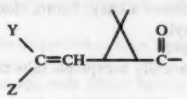
Int. Cl.[3] A01N *53/00;* C07C *61/04, 61/35*

U.S. Cl. 424—305 12 Claims

1. A 4-substituted-2-indanyl compound of the formula



wherein R^1 is phenyl which may be substituted with halogen or lower alkyl; R^2 is 2,2,3,3-tetramethylcyclopropanecarbonyl, 1-(4-chlorophenyl)-2-methylpropylcarbonyl, or a group of the formula



wherein Y and Z, the same or different, are hydrogen, halogen, lower alkyl, perhalo(lower)alkyl, phenyl which may be substituted with halogen or lower alkyl, or phenylthio which may be substituted with halogen or lower alkyl, with the proviso that one of Y and Z is other than hydrogen; and the isomer of S configuration at C-2 of the indanyl ring is present in an enantiomeric excess of at least 25% over the isomer of R configuration at C-2 of the indanyl ring.

11. A method for controlling insects or acarids which comprises applying to the insect or acarid or to a locus where control is desired an insecticidally or acaricidally effective amount of the compound of claim 1, 2, 3, 4, 5, 6, 7, 8, or 9.

4,333,951

2-AMINO-6-BIPHENYLACETIC ACIDS

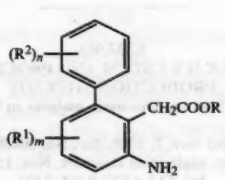
David A. Walsh, Richmond, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

Continuation-in-part of Ser. No. 57,118, is a continuation-in-part of Ser. No. 851,641, Nov. 15, 1977, abandoned. This application Jul. 2, 1980, Ser. No. 165,323

Int. Cl.[3] C07C *101/447;* A61K *31/195, 31/215*

U.S. Cl. 424—319 12 Claims

1. A compound exhibiting muscle relaxant activity selected from the group having the formula:



wherein;

R is hydrogen or lower alkyl,

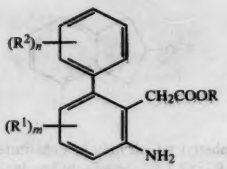
R^1 is fluoro, chloro, bromo, lower alkyl or amino,

R^2 is lower alkyl, lower alkoxy, fluoro, chloro, bromo, amino or trifluoromethyl,

n is 0–3 and m is 0–2,

and the pharmaceutically acceptable salts thereof.

9. A method for providing muscle relaxation in a living animal body with a minimum of undesirable side effects comprising internally administering to said living animal body an effective amount of a compound selected from the group having the formula:



wherein;
R is hydrogen or lower alkyl,
R^1 is fluoro, chloro, bromo, lower alkyl or amino,
R^2 is lower alkyl, lower alkoxy, fluoro, chloro, bromo, amino or trifluoromethyl,
n is 0–3 and m is 0–2,
and the pharmaceutically acceptable salts thereof.

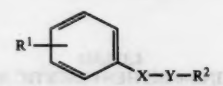
4,333,952

GROWTH PROMOTORS FOR RUMINANTS

Brian G. McDonald, Mosspark, Scotland, assignor to Beecham Group Limited, England

Filed Jun. 30, 1980, Ser. No. 164,085
Claims priority, application United Kingdom, Jul. 10, 1979, 7924026; Dec. 1, 1979, 7941534
Int. Cl.³ A61K *31/085, 31/12, 31/135, 31/045*
U.S. Cl. 424—330 **25 Claims**

1. The method of promoting growth in ruminants by inhibiting methane production and enhancing proprionate production which comprises orally administering to a ruminant an effective nontoxic amount of a compound of the formula:



or a pharmaceutically acceptable salt thereof wherein
R^1 is hydrogen, halo or alkoxy of 1 to 4 carbon atoms;
X is oxygen, carbonyl, hydroxymethylene or NR^3 in which R^3 is hydrogen, alkyl of 1 to 4 carbon atoms or $-YR^2$,
Y is $—CH_2CHOH—$ or, provided X is carbonyl, —CH=CH; and
R^2 is alkyl of 1 to 4 carbon atoms, one carbon atom of which is di- or trihalogenated.

4,333,953

CREAMY MILK ICE CREAM AND PROCESS FOR THE PRODUCTION THEREOF

Jan Trzecieski, Naerum, Denmark, assignor to Kirk Chemicals, Denmark

Filed Nov. 7, 1980, Ser. No. 204,804
Claims priority, application Denmark, Nov. 12, 1979, 4780/79
Int. Cl.³ A23G *9/04, 9/02*
U.S. Cl. 426—34 **7 Claims**

1. A process for the production of creamy milk ice cream which per 100 parts by weight of the mlik ice cream comprises mixing 12–15 parts of milk solid non fat with lactase, sugars, stabilizer, emulsifier and water, then holding the resulting mixture under conditions suited to enzymatic hydrolysis of lactose until at least about 50% of the lactose in the mixture has been hydrolyzed, thereafter adding 2–4 parts of edible fat the lactase, sugars, stabilizer, emulsifier and water being the balance by weight of said hundred parts, then pasteurizing, followed by homogenizing and subsequently freezing, followed by hardening.

4,333,954

SOFT ICE CREAM AND PROCESS FOR PRODUCTION THEREOF

Jan Trzecieski, Naerum, Denmark, assignor to Kirk Chemicals, Denmark

Filed Nov. 7, 1980, Ser. No. 204,803
Claims priority, application Denmark, Nov. 12, 1979, 4779/79
Int. Cl.³ A23G *9/04, 9/02*
U.S. Cl. 426—41 **6 Claims**

1. A process for the production of a reduced in hardness ice cream which comprises mixing demineralized whey powder, lactase, sugars, stabilizer, emulsifier and water, the demineralized whey being present as about 9–12% by weight of the ice cream, then holding the resulting mixture under conditions suited to enzymatic hydrolysis of lactose until at least about 50% of the lactose content in the mixture has been hydrolyzed, thereafter in succession adding edible fat, the edible fat being present as about 7–12% by weight of the ice cream, pasteurizing, homogenizing and freezing and then hardening.

4,333,955

PROCESSED DRIED BEANS AS INSTANT FOOD AND THEIR MANUFACTURING METHOD

Susumu Murata; Noriyuki Shimizu, both of Osaka, and Sadao Kokeguchi, Ibaragi, all of Japan, assignors to Kanebo Foods, Ltd., Tokyo, Japan

Filed Jul. 2, 1980, Ser. No. 166,692
Claims priority, application Japan, Jul. 5, 1979, 54-85608
Int. Cl.³ A23L *1/20*
U.S. Cl. 426—44 **25 Claims**

23. A method for producing processed dried beans which are quickly restored to the condition of boiled soft raw beans by immersion in hot water, said beans being rich in starch and poor in both protein and fat, said method comprising the steps of:
(1) boiling said raw beans in water at least once;
(2) enzymatically treating said boiled beans by contacting said boiled beans with an aqueous solution of a cellulase enzyme or a mixture of cellulase and pectinase enzymes at a pH of about 3.0 to about 7.0 for a period of time sufficient to destroy the cellulosic substances or the cellulosic and pectic intercellular substances existing in the cell walls of the beans allowing improved permeation of hot water into the core of each bean so treated;
(3) boiling said enzyme-treated beans of step (2) in an acidic solution at a pH of about 1.5 to about 5.5 to swell and gelatinize the starch component contained in the bean cells: and thereafter
(4) drying the beans boiled in step (3) using super-heated steam having a super-heat degree of about 60° to about 150° C. and a drying ability of up to about 0.8 until the beans have a water content of about 8 to about 12% by weight relative to the weight of the dried beans, thereby producing dried processed beans having a good appearance and substantially free from cracks and fractures.

4,333,956

CALCIUM AMMONIUM LACTATE AND SOLIDIFIED FERMENTED AMMONIATED CONDENSED WHEY

Fred W. Juengst, Jr., Green Bay, and John A. Dika, Kewaunee, both of Wis., assignors to Calor Agriculture Research, Inc., Okemos, Mich.

Continuation-in-part of Ser. No. 93,162, Nov. 13, 1979, abandoned. This application Jan. 4, 1980, Ser. No. 109,480
Int. Cl.³ A23K *1/08*
U.S. Cl. 426—69 **14 Claims**

1. A method of producing a ruminant feed containing solidified fermented ammoniated condensed whey which method consists essentially of mixing fermented ammoniated condensed whey containing 35–55% ammonium lactate with an effective amount of a calcium salt of a strong mineral acid selected from the group consisting of calcium chloride, cal-

cium sulfate and calcium phosphate to cause the solidification of said fermented ammoniated condensed whey, and allowing the resulting mixture to stand until it has solidified.

4,333,957

CAPSULE AND PROCESS FOR THE PRODUCTION OF A COLORED GELATIN CAPSULE

Yakutaro Okajima, Tokyo, and Keiji Sekigawa, Sagamihara, both of Japan, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Oct. 21, 1980, Ser. No. 198,992
Int. Cl.³ A23L *1/00*; A23J *3/00*
U.S. Cl. 426—140 4 Claims

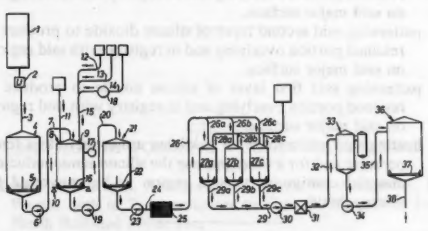
1. A process for coloring gelatin used for forming gelatin capsules comprising: a. homogeneously dispersing carminic acid or laccaic acid and ammonium alum and/or potassium alum in the gelatin, and b. forming gelatin capsules from the resulting gelatin dispersion.

4,333,958

METHOD FOR THE MANUFACTURE OF WHEY PRODUCTS

Eric R. Egnell, Tyresö, Sweden, assignor to Nedre Norrlands Producentforening ek. for, Bangardsgatan, Ostersund, Sweden

Continuation-in-part of Ser. No. 952,934, Oct. 20, 1978, Pat. No. 4,253,386. This application Oct. 20, 1980, Ser. No. 198,361
Claims priority, application Sweden, Oct. 28, 1977, 7712167
Int. Cl.³ A23C *21/00*
U.S. Cl. 426—583 4 Claims



1. A method for the production of eatable whey products, comprising the sequential steps of

(1) concentrating whey obtained from the byproducts of milk of cows or goats to a total solids content of between 40–80% by weight,

(2) adding non-heat-sensitive raw materials selected from the group consisting of sugars and fats of butter type to said concentrate to form a mixture therewith,

(3) adjusting the acidity of said mixture by the addition of pH-regulating agents of food quality so as to obtain a pH of between 5.8 and 6.8,

(4) heating said pH-adjusted mixture at a temperature of between 85° and 140° C. for a time sufficient to precipitate the whey proteins,

(5) thereafter adding heat-sensitive additives selected from the group consisting of flavoring agents and preservatives to said mixture,

(6) maintaining the mixture at about 95° C. for about 30 minutes,

(7) mechanically working said mixture to homogenize said precipitated proteins therein, thereby forming a homogenized product,

(8) cooling the thus homogenized product to a temperature C, between 5° and about 60° and

(9) storing said product for a time sufficient to obtain a predetermined consistency.

4,333,959

DECHOLESTERIZATION OF EGG-YOLK

Umberto Bracco, and Jean-Louis Viret, both of La Tour-de-Peilz, Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Sep. 26, 1980, Ser. No. 190,975
Int. Cl.³ A23L *1/32*
U.S. Cl. 426—614 13 Claims

1. A process for reducing the amount of cholesterol in egg-yolk which comprises the steps of:

(a) reducing the pH of fresh, wet egg-yolk to destabilise the emulsion;

(b) treating the destabilised egg-yolk emulsion with a substantially cholesterol-free edible oil to form a fine dispersion;

(c) centrifuging the dispersion to form an egg-yolk phase and an oil phase; and

(d) separating the egg-yolk phase having reduced cholesterol content from the oil phase.

4,333,960

PROCESS FOR PRODUCING DEHYDRATED RICE AND PRODUCT FROM PARBOILED RICE

James A. Barry, Carlow, and James McGarry, Kilkieran, both of Ireland, assignors to Comhlucht Siuicre Eireann Teoranta (Irish Sugar Company Limited), Dublin, Ireland

Filed Jul. 1, 1980, Ser. No. 165,062
Claims priority, application Ireland, Jul. 3, 1979, 474/79; May 16, 1980, 1032/80
Int. Cl.³ A23L *1/182*
U.S. Cl. 426—625 14 Claims

1. A process for the production of dehydrated rice without mechanical compression of the rice grains, said dehydrated rice being capable of rehydration to a palatable state in 2–3 minutes by the addition of boiling water thereto, without additional cooking, which process comprises soaking parboiled rice, washing it, cooking the soaked rice, drying the cooked rice to a moisture content in the range 2–20% by weight, and puffing the dried rice at a temperature in the range 180°–350° C.

4,333,961

PREPARATION OF THIN, ALIGNED MAGNETIC COATINGS

Calvin A. Bruce; Andrew M. Homola, and Max R. Lorenz, all of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1981, Ser. No. 259,270
Int. Cl.³ B05D *1/04*
U.S. Cl. 427—13 15 Claims

1. A method for applying a magnetic coating to a disk substrate comprising the steps of:

coating said substrate with an active coating material having an electrostatic charge in an aqueous environment to form an active layer,

applying to the active coating material magnetic particles coated with colloidal silica, said silica-coated magnetic particles having an electrostatic charge thereon in an aqueous environment opposite to the charge on said active coating material, whereby the magnetic particles are electrostatically attracted to and bonded to said active material to form a magnetic layer, and

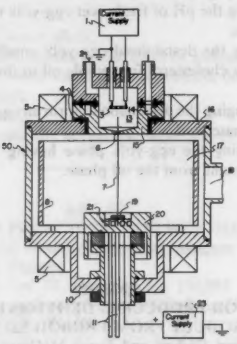
applying a magnetic field to said magnetic particles to magnetically align said particles.

4,333,962

METHOD FOR PRODUCING GOLD COLOR COATINGS

Hans K. Pulker, Triesen, Liechtenstein, and Helmut Daxinger, Wangs, Switzerland, assignors to Balzers Aktiengesellschaft, Liechtenstein

Filed Aug. 29, 1980, Ser. No. 182,800
Claims priority, application Switzerland, Sep. 4, 1979, 7971/79
Int. Cl.³ C23C 11/14
U.S. Cl. 427—37 11 Claims



1. A method of controlling color hues of coatings on substrates using a housing capable of being evacuated and having an evaporation chamber therein, a hot cathode chamber therein in communication with the evaporation chamber, a support structure for the substance to be coated in said housing evaporation chamber and a crucible for material to be evaporated spaced from said support structure in said evaporation chamber and forming an anode, and a hot cathode in the hot cathode chamber, the method comprising evaporating the material in the evaporation chamber while maintaining a residual gas atmosphere containing nitrogen therein, producing an electric gas arc discharge between the cathode and anode of a low voltage, admixing a carbon containing gaseous compound to the residual gas, and applying a negative biasing voltage relative to the housing to the substrate to be coated.

4,333,963

RADIATION CURABLE COMPOSITIONS CONTAINING β-CYANOETHOXYALKYL ACRYLATES

William D. Emmons, Huntingdon Valley; Donald A. Winey, Warminster, and Nicholas A. Rounds, New Britain, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 30, 1980, Ser. No. 222,784
Int. Cl.³ B05D 3/00
U.S. Cl. 427—44 8 Claims

1. A radiation curable composition comprising

(a) about 5–95% by weight, based on total composition, of at least one cyanoethoxyalkyl acrylate having the formula

$$H_2C{=}{-}CH{-}C(O){-}O{-}R{-}O{-}CH_2CH_2CN$$

wherein R is a (C_2–C_5) alkylene group or a (C_2–C_5) oxaalkylene group having discrete alkylene segments containing at least two carbon atoms joined by the oxygen atom;

(b) about 1–90% by weight, based on total composition, of at least one radiation curable component selected from the group of an acrylated polymer or oil and a urethane prepolymer; and

(c) from 0 up to about 5% by weight, based on total composition, of a photoinitiator.

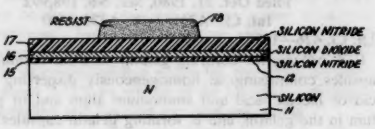
5. A method of coating a substrate which comprises applying to the substrate a composition according to claim 1 and curing or drying the coated substrate by exposing the coated substrate to radiation.

4,333,964

METHOD OF MAKING INTEGRATED CIRCUITS

Mario Ghezzo, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 15, 1980, Ser. No. 187,430
Int. Cl.³ B05D 5/12; H01L 21/306
U.S. Cl. 427—93 5 Claims



1. The method of providing in a substrate of silicon semiconductor material having a major surface, a thick layer of silicon dioxide contiguous to a region of said substrate adjacent said major surface comprising:

providing said substrate of silicon semiconductor material having said major surface,

forming a first thin layer of silicon nitride on said major surface,

forming a second thin layer of silicon dioxide on said layer of silicon nitride,

forming a third layer of silicon nitride on said second layer of silicon dioxide,

patterning said third layer of silicon nitride to produce a retained portion overlying and in registry with said region on said major surface,

patterning said second layer of silicon dioxide to produce a retained portion overlying and in registry with said region on said major surface,

patterning said first layer of silicon nitride to produce a retained portion overlying and in registry with said region on said major surface,

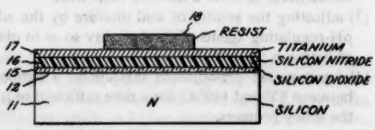
heating said substrate in an oxidizing atmosphere to a temperature and for a time to cause the silicon semiconductor material contiguous to said region to be converted to silicon dioxide.

4,333,965

METHOD OF MAKING INTEGRATED CIRCUITS

Tat-Sing P. Chow, Schenectady, and Mario Ghezzo, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 15, 1980, Ser. No. 187,501
Int. Cl.³ B05D 5/12; H01L 21/306
U.S. Cl. 427—93 7 Claims



1. The method of providing in a substrate of semiconductor material having a major surface a thick layer of silicon dioxide contiguous to a region of said substrate adjacent said major surface comprising:

providing said substrate of silicon semiconductor material having a major surface,

forming a first thin layer of silicon dioxide on said major surface,

forming a second thick layer of silicon nitride on said first layer of silicon dioxide,

forming a third layer of an ion erosion resistant material on said second layer of silicon nitride,

patterning said third layer of ion erosion resistant material to produce a retained portion overlying and in registry with said region of said major surface,

patterning said second and first layers using said retained portion of said third layer as a mask by ion beam etching orthogonally to the plane of said major surface to produce retained portions of said second and first layers each overlying and in registry with said region of said major surface and to remove portions of said substrate to form a mesa the top of which is said region,

removing said retained portion of said third layer,

depositing a fourth layer of silicon nitride over exposed portions of said substrate including the side walls of said mesa and said retained portions of said first and second layers,

removing the portions of said fourth layer of silicon nitride contiguous to and overlying said major surface of said substrate,

heating said substrate in an oxidizing atmosphere to a temperature and for a time to cause exposed portions of said substrate to be converted to a thick layer of silicon dioxide,

removing the portions of said second and fourth layers of silicon nitride covering said mesa to expose the side walls thereof,

heating said substrate to cause exposed portions of the side walls of said mesa to be converted to silicon dioxide.

4,333,966

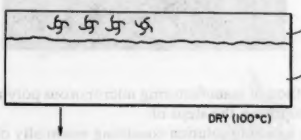
METHOD OF FORMING A CONDUCTIVE METAL PATTERN

Robert J. Deffeyes, Arlington, and Harris W. Armstrong, Ft. Worth, both of Tex., assignors to Graham Magnetics, Inc., North Richland Hills, Tex.

Division of Ser. No. 62,016, Jul. 30, 1979, Pat. No. 4,289,534, which is a division of Ser. No. 793,384, May 3, 1977, Pat. No. 4,186,244. This application Dec. 24, 1980, Ser. No. 219,943

Int. Cl.³ H05K *3/00*

U.S. Cl. 427—96 **9 Claims**



1. A process for making a conductive metal pattern on a non-conductive substrate comprising the steps of

(1) forming a pattern, on said non-conductive substrate, of a coating comprising a non-conductive, fusible, metal-powder product; said fusible metal-powder product being formed by a chemical reaction of (a) a metal-powder substrate, with (b) hydrocarbon-chain-bearing reactants; and whereon said hydrocarbon chains are chemically bonded to said metal powder substrate to form a non-conductive barrier layer chemically reacted to said metal; and

(2) thermally decomposing said barrier material and causing said non-conductive metal powder product to fuse into said conductive coating.

4,333,967

PROCESS OF MAKING A THERMOSENSITIVE RECORDING MATERIAL

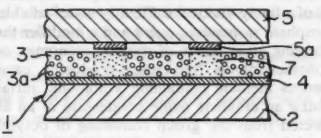
Nobuhiro Miyakawa, Kobe, and Tatsuo Aizawa, Osaka, both of Japan, assignors to Mita Industrial Company, Tokyo, Japan

Division of Ser. No. 136,068, Mar. 28, 1980, which is a continuation of Ser. No. 971,833, Dec. 19, 1978, abandoned. This application Jan. 12, 1981, Ser. No. 224,626

Claims priority, application Japan, Dec. 21, 1977, 52-154855

Int. Cl.³ B41M *3/12*

U.S. Cl. 427—148 **11 Claims**



1. A process for producing a thermosensitive recording material comprising a matrix of an electrically insulating, film-forming thermoplastic resin and, dispersed as a fine powder in the matrix, at least one linear aliphatic dicarboxylic acid having at least 13 carbon atoms and a melting point of not more than 150° C. or its ammonium salt, the amount of the linear aliphatic dicarboxylic acid or its ammonium salt being 5 to 40 parts by weight per 100 parts by weight of the resin matrix, which comprises intimately mixing a solution or dispersion of the electrically insulating, film-forming thermoplastic resin with 5 to 40 parts by weight per 100 parts by weight of the resin of the linear aliphatic dicarboxylic acid or its ammonium salt, and drying the resulting mixture at a temperature of not more than 40° C.

4,333,968

THERMOPLASTIC PACKAGING FILMS WITH IMPROVED HEAT-SEAL CHARACTERISTICS

A. Michael Nahmias, Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 25, 1980, Ser. No. 115,530

Int. Cl.³ B05D *3/02, 3/12, 3/00;* B32B *27/08*

U.S. Cl. 427—173 **1 Claim**

1. A method for producing coated biaxially oriented polypropylene film, said film being adapted for heat sealing in a manner whereby the seal may be peeled apart without damaging the film layers in the seal area, which comprises the sequential steps of:

a. Extruding a polypropylene base film and orienting said film in the longitudinal direction;

b. Extrusion coating at least one surface of said oriented film with a single layer of an ethylene-vinyl acetate copolymer coating to form a coated film, said copolymer containing from about 6% up to about 10% by weight vinyl acetate in said copolymer;

c. Preheating said coated film at a heating rate of above about 5° F. per second and below about 40° F. per second; and

d. Orienting the resultant preheated coated film in the transverse direction.

4,333,969

PROCESS FOR PRODUCING STYRENIC POLYMER BEADS OF PREFERRED BEAD SIZE

Harold A. Wright, Murrysville, and Alvin R. Ingram, West Chester, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 23, 1980, Ser. No. 219,453
Int. Cl.[3] B05D 7/00; C08F 112/08
U.S. Cl. 427—222 11 Claims

1. A process for forming styrenic polymer beads having a preferred diameter bead size from styrenic polymer beads of a lesser diameter bead size comprising:

(a) forming a suspension of said styrenic polymer beads of a lesser diameter bead size in an aqueous medium with the aid of a finely divided, difficultly water-soluble, inorganic phosphate suspending agent and a modifier therefor,

(b) forming an emulsion of styrenic monomer, containing a monomer-soluble free-radical-producing catalyst, in an aqueous medium containing a nonionic surfactant comprising an ethylene oxide condensate of an alkylphenol, selected from the group consisting of octylphenols and nonylphenols, said surfactant containing at least fifty moles of ethylene oxide per mole of alkylphenol, and

(c) adding said styrenic emulsion continuously over a period of time to said styrenic polymer bead suspension and subjecting the mixture so formed to an elevated temperature to polymerize said styrenic monomer about said styrenic polymer beads.

4,333,970

PROCESS FOR PRODUCING COATED BEADS WITH MACROMONOMER-STYRENE POLYMERIZATE COATING

Elizabeth A. Blommers, Newtown Square; David R. Warfel, Exton, and Alvin R. Ingram, West Chester, all of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 23, 1980, Ser. No. 219,465
Int. Cl.[3] B05D 7/00; C08F 212/08, 236/10
U.S. Cl. 427—222 7 Claims

1. A process for forming coated styrenic polymer beads which exhibit anti-lumping properties upon preexpansion and which are useful in producing soft foamed articles comprising:

(a) forming an aqueous suspension of initial styrenic polymer beads with the aid of a finely divided, difficulty water-soluble, inorganic phosphate suspending agent and a modifier therefore;

(b) forming an emulsion containing a coating composition, consisting of a major amount of a styrenic monomer and a minor amount of a conjugated diene-styrene macromonomer, which is an anionically prepared polymer of molecular weight between 5000 and 50,000 terminated with a reactive monofunctional polymerizable group, and containing a styrenic monomer-soluble free-radical-producing catalyst; in an aqueous medium containing a nonionic surfactant comprising an ethylene oxide condensate of an alkylphenol, selected from octylphenols and nonylphenols, said surfactants containing at least thirty moles of ethylene oxide per mole of alkylphenol;

(c) adding said emulsion to said styrenic polymer bead suspension to form a mixture thereof, while maintaining the suspension at an elevated temprature; and maintaining the mixture so formed at an elevated temperature to cause said coating composition to polymerize and form a coating about said initial styrene beads.

4,333,971

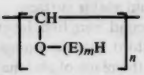
SUBSTRATE TREATING COMPOSITIONS

Donald N. Van Eenam, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jun. 5, 1981, Ser. No. 270,777
Int. Cl.[3] B05D 3/02
U.S. Cl. 427—389.9 14 Claims

1. A process for improving the physical properties of a fibrous substrate which comprises applying thereto a composition of matter comprising:

A. a polyether-ene having the formula



where Q is a moiety terminating in the residue of an active hydrogen-containing group selected from the group consisting of alcoholic hydroxyl, thiol, amide, carboxylic acid and secondary amine with an active hydrogen removed, E is a moiety containing a radical having an activated olefinic unsaturation, either α,β or β,γ to the activating group, n is the number of adjacent segments having this formula, and n and m are integers and are each at least 1, provided that where one is less than 4 the other is at least 4; and

B. a non-air-curing compound having a structure comprising at least two free-radical polymerizable unsaturated groups;

and allowing the composition to thermoset cure irreversibly on the substrate.

4,333,972

HIGHLY ANISOTROPIC MEMBRANES

Robert E. Kesting, Irvine, Calif., assignor to Puropore, Inc., Tustin, Calif.

Filed Jun. 25, 1980, Ser. No. 162,679
Int. Cl.[3] B05D 5/00
U.S. Cl. 427—244 8 Claims

1. A method of manufacturing microporous polymeric membranes comprising the steps of:

forming a casting solution consisting essentially of a solvent, a non-solvent and polymer, the solvent being selected from the group consisting of methyl formate, propylene oxide or mixtures thereof, the non-solvent consisting essentially of isopropyl alcohol, t-butyl alcohol or a mixture of said alcohols, and the polymer being selected from the group consisting of cellulose nitrate and mixtures of cellulose nitrate and cellulose acetate, cellulose nitrate content exceeding cellulose acetate content therein;

casting said solution onto a substrate; and

allowing the solvent and the non-solvent, respectively, to evaporate to thereby form an anisotropic cellulosic membrane having a first pore size adjacent one surface and a second smaller pore size adjacent the other surface of the membrane.

4,333,973
INSULATING MACHINE AND PROCESS

Francis V. Bellafiore; Michael P. Duff, and David M. O'Meara, all of Joliet, Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Aug. 7, 1980, Ser. No. 176,185
Int. Cl.[3] B05D 1/02
U.S. Cl. 427—424 23 Claims

1. A method of applying a bed of polymeric insulating foam which comprises:

spraying by means of a nozzle a liquid composition, which quickly expands and sets into a dry polymeric insulating foam, in a predetermined pattern of travel onto a horizontal or sloped surface to thereby deposit a layer of insulating foam in the form of a band of preset length and width and with a forward face sloped for a substantial part of the band width;

spraying a second band of the liquid composition in a substantially similar predetermined pattern, length and width, as that of the prior layer, onto substantially all of the sloped forward face of the prior band to thereby deposit a sloped second foamed layer as a band on, and without significantly exceeding the height of, the first foamed band; and

then applying a sloped third foam band to the second band in a similar manner followed by the consecutive application of additional sloped foam bands until an insulating bed comprising a multitude of sloped foam layers in the form of bands of substantially uniform height or thickness and length is deposited.

4,333,974
CANDY-COVERED FIGURINE AND METHOD OF PRODUCING

Frances P. Davis, 4808 Holston Heights La., Knoxville, Tenn. 37914

Filed Oct. 1, 1979, Ser. No. 81,021
Int. Cl.[3] A01N 1/00; B32B 7/08; B23P 3/00, 25/00, 11/00
U.S. Cl. 428—16 18 Claims

1. A process for manufacturing a figurine partially covered with candy comprising the steps of:

inserting a first end of an elongated member into a styrofoam head member;

inserting the further end of said elongated member into a styrofoam body member thereby joining said head and body members and forming a head and body juncture;

joining a lower extremity member to said styrofoam body member substantially opposite said inserted elongated member thereby forming a body-foot juncture;

mounting ear and mouth members at selected ear and mouth locations on said styrofoam head member;

dipping said head member with said mounted ear and mouth members, below said head and body juncture into a reinforcing mixture to color said styrofoam head member and said ear and mouth members a desired color;

mounting eye members at selected locations on said dipped styrofoam head member;

reinforcing said body-foot juncture;

joining hand and arm members to said styrofoam body members; and

securing colorful wrapped candies at selected locations on said styrofoam head and body members.

5. A process for manufacturing a figurine partially covered with candy comprising the steps of:

covering a first end of an elongated member with an adhesive and inserting said adhesive covered first end into a styrofoam head member;

covering the further end of said elongated member with adhesive and inserting said further end into a styrofoam body member, thereby joining said head and body members;

joining a lower extremity member to said styrofoam body member at a location substantially opposite said inserted elongated member;

reinforcing the juncture between said styrofoam body member and other selected members joined thereto;

joining hand and arm members to said styrofoam body member;

forming depressions in said styrofoam head member at selected locations for receiving eyes, ears and mouth members;

coloring said styrofoam members to provide desired flesh tones;

securing said eye, ear and mouth members in said depressions;

painting said styrofoam head member to provide facial details;

attaching selected decorative details at selected locations on said members; and

securing colorfully wrapped candies at selected locations to said styrofoam members thereby providing a colorful figurine.

17. A candy-covered figurine comprising:

a head member fabricated from a styrofoam material;

a rigid elongated member having a first and further end, said first end inserted in said styrofoam head member;

ear and mouth members mounted at selected locations on said styrofoam head member;

a body member fabricated from a styrofoam material and joined to said head member by inserting said further end of said rigid elongated member in said body member to form a head-body juncture, said heat-body juncture being reinforced by dipping said head member and said head-body juncture into a reinforcing and covering mixture which serves to cover said head member a preselected color;

a lower extremity member mounted on said styrofoam body member at a location substantially opposite said head-body juncture;

eye members mounted at selected locations on said dipped styrofoam head member;

arm members joined to said styrofoam body member; and

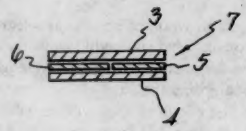
a multiplicity of colorful wrapped candies secured at selected location on said styrofoam head and body members.

4,333,975

FLAT GASKET LAMINATE OF EXPANDED GRAPHITE FOIL AND METALLIC REINFORCEMENT LAYER

Geoffrey Booth, Huddersfield, England, assignor to Flexitallic Gaskets Limited, Heckmondwike, England

Filed Dec. 5, 1980, Ser. No. 213,504
Claims priority, application United Kingdom, Dec. 15, 1979, 7943297
Int. Cl.³ B32B 3/02; F16J 15/00
U.S. Cl. 428—65 3 Claims



1. A flat gasket consisting essentially of a laminate of layers of expanded graphite foil and a metallic reinforcement layer, the graphite foil layers being so disposed as to overlap with and enclose the reinforcement layer within the gasket in relation to at least one edge thereof, said one edge being that edge of the gasket which in use is exposed to an aggressive environment.

2. The gasket of claim 1 wherein the metallic reinforcement layer projects beyond the graphite foil layers at the opposite edge to said one edge and the projecting portion thereof constitutes locating means for the gasket on installation.

4,333,976

COMPOSITE WOVEN OR KNITTED FABRIC

Miyoshi Okamoto, Takatsuki, and Mineto Fushida, Shiga, both of Japan, assignors to Toray Industries, Incorporated, Tokyo, Japan

Continuation of Ser. No. 20,541, Mar. 14, 1979, abandoned. This application Feb. 25, 1980, Ser. No. 124,352
Claims priority, application Japan, Mar. 15, 1978, 53-28639
Int. Cl.³ B32B 33/00
U.S. Cl. 428—91 11 Claims

1. Woven or knitted fabric containing a plurality of naps composed of bundles of superfine fibers of less than 0.7 denier which are bound with a cured organic silicone polymer.

4,333,977

WEAR-RESISTANT ARTICLE

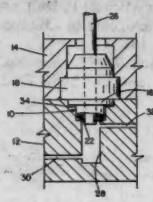
Louis Abrahams, Worcester, and Thomas P. J. Izod, Holliston, both of Mass., assignors to Waters Associates, Inc., Milford, Mass.

Filed Aug. 27, 1980, Ser. No. 181,908
Int. Cl.³ B32B 3/10, 27/00; C08K 7/02
U.S. Cl. 428—131 7 Claims

1. A sintered, molded wear-resistant shaped article having a non-oxidized surface and having the empirically derived formula $CF_{1.28}$ made from a molded and sintered granular mixture consisting essentially of 74–84% by weight polytetrafluoroethylene, 7–17% by weight graphite fibers, and 4–14% by weight fluorinated graphite.

3. The article of claim 1 wherein said article includes a working surface that rubs against another surface moving relative thereto.

4. The article of claim 3 wherein said working surface is a sealing surface and said article has the form of an annular seal.



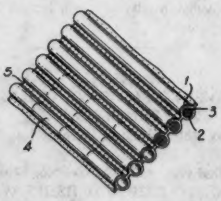
6. The seal of claim 4 wherein there is a bore passing therethrough and an annular spring element embedded in the seal all around said bore.

4,333,978

METHOD AND APPARATUS FOR PRODUCING A COMPOSITE MATERIAL HAVING ULTRASONICALLY WELDED SEAMS WHICH CONFINE STRANDS

Walter Kocher, Mozart Strasse 11, 8671 Selbitz, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 105,295, Dec. 19, 1979. This application Jan. 19, 1981, Ser. No. 226,522
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1979, 7909013[U]; Jul. 18, 1979, 2928941; European Pat. Off., Feb. 13, 1980, 80100728.7
Int. Cl.³ B06B 3/00; B29C 27/08; B32B 3/22, 31/21; B65B 11/00
U.S. Cl. 428—158 24 Claims



1. An article of manufacture comprising:
a lower layer;
an upper layer ultrasonically welded to said lower layer along substantially parallel, spaced apart weld seams; and
an intermediate layer disposed between said upper layer and said lower layer, wherein at least one of said upper, lower and intermediate layers is applied with a tensile stress which is different from the tensile stress on at least another of said upper, lower and intermediate layers when said upper layer is ultrasonically welded to said lower layer.

6. A method of producing a composite material of the type having an upper layer, a lower layer and an intermediate layer disposed between said upper layer and said lower layer, comprising the steps of:
ultrasonically welding said upper layer to said lower layer along substantially parallel, spaced apart weld seams;
feeding said intermediate layer between said upper layer and said lower layer during said step of ultrasonically welding; and
applying a tensile stress to at least one of said upper, lower and intermediate layers during said step of ultrasonically welding which is different from the tensile stress on at least another of said upper, lower and intermediate layers.

15. Apparatus for producing a composite material of the type having an upper layer, a lower layer and an intermediate layer disposed between said upper layer and said lower layer, comprising:
welding means for ultrasonically welding said upper layer to

said lower layer along substantially parallel, spaced apart weld seams;

feeding means for feeding said intermediate layer to said welding means between said upper layer and said lower layer; and

tension means for applying a tensile stress to at least one of said upper, lower and intermediate layers which is different from the tensile stress on at least another of said upper, lower and intermediate layers.

4,333,979

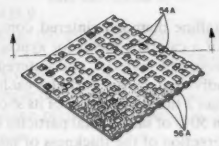
SOFT, BULKY, LIGHTWEIGHT NONWOVEN WEB AND METHOD OF PRODUCING; THE WEB HAS BOTH FUSED SPOT BONDS AND PATTERNED EMBOSSMENTS

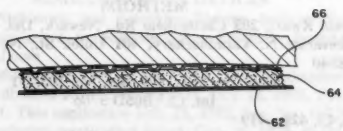
Michael A. Sciaraffa; David G. Thome, both of Appleton, and Clifford M. Vogt, Neenah, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 18, 1980, Ser. No. 179,054

Int. Cl.³ A61F *13/16*; D04H *3/14, 5/06*

U.S. Cl. 428—179 **15 Claims**





1. Nonwoven web having a basis weight in the range of from 0.4 oz/yd^2 to 2.0 oz/yd^2 and density in the range of from 0.08 to 0.20 g/cc comprising randomly oriented thermoplastic filaments overlapping and bonded with a fine pattern of fused bond areas covering 5 to 50% of the web surface with a frequency of 50 to 3200 bond areas per square inch and individual bond area in the range of 0.0005 to 0.0015 in^2, said web also containing a gross pattern of embossments covering 5 to 80% of the web surface with a frequency of 1 to 500 embossments per square inch and individual embossment area in the range of 0.003 to 0.03 in^2 resulting in an effective Ames web thickness of at least 0.010 inch.

10. Method of forming a lightweight, bulky nonwoven web comprising the steps of,

(a) melt spinning a thermoplastic polymer into filaments,

(b) collecting said filaments into a randomly oriented, overlapping web,

(c) bonding said web under pressure producing a fine pattern of fused bond areas covering 5 to 50% of the web surface with a frequency of 50 to 3200 bond areas per square inch and individual bond area in the range of 0.0005 to 0.0015 in^2, and

(d) embossing said web under pressure producing a gross pattern of embossments covering 5 to 80% of the web surface with a frequency of 1 to 500 embossments per square inch and individual embossment area in the range of from 0.003 to 0.030 in^2.

4,333,980

MULTI-PLY FABRIC STRUCTURE INCLUDING INTERLINER

William M. Russell, Belchertown, Mass., assignor to Facemate Corporation, Chicopee, Mass.

Continuation-in-part of Ser. No. 888,025, Mar. 20, 1978, abandoned. This application May 18, 1979, Ser. No. 40,442

Int. Cl.³ B32B *27/14*

U.S. Cl. 428—192 **12 Claims**

1. Multi-ply fabric structure for use in fabricating garment components comprising at least one outer fabric ply and a fabric interliner having on one surface a heat responsive, permanent type adhesive and on the opposite surface a temporary fusible adhesive, the adhesive properties of which are removable by laundering, said temporary and permanent adhesives disposed at discontinuous bond sites being simultaneously activatable to a tacky condition within a first range of heat and dwell time, said outer fabric ply being superposed in generally edge-to-edge abutting relation against said interliner, outer edge portions of both said interliner and fabric ply being folded inwardly to overlapping relation against the marginal portions of said interliner, the overlapped edge and marginal portions of the interliner and fabric ply being bondable together by activation of said temporary and permanent adhesives within said first energy level range for providing temporary adhesive bonding between said overlapped edge and marginal portions of the interliner and the outer ply, said permanent adhesive being further responsive to a substantially higher energy level than said first range for permanent bonding onto one surface of said interliner.

4,333,981

ABRASION RESISTANT IMPACT ABSORBENT ANIMAL STALL FLOOR AND WALL COVERING

Armand G. Winfield, and Barbara L. Winfield, both of P.O. Box 1296, Santa Fe, N. Mex. 87501

Filed May 5, 1980, Ser. No. 146,775

Int. Cl.³ B32B *7/02*

U.S. Cl. 428—215 **24 Claims**

1. An abrasion resistant, impact absorbent animal stall floor and wall covering which comprises a laminate of:

(a) a liquid impermeable layer of an ionomer resin, said layer having an aggregate minimum thickness of about 5 mils, superimposed upon

(b) a foamed resin layer having an aggregate minimum thickness of about 200 mils, and an aggregate density in the range of from about 0.50 to about 10.0 lbs. per cubit foot.

4,333,982

FUSIBLE INTERLINING OF A TEXTILE SHEET AND A HEAT-SEALABLE FILM FOR WASHABLE GARMENTS

Edward R. Rand, Paris, France, assignor to Lainiére de Picardie, Péronne, France

Filed Jul. 30, 1980, Ser. No. 173,602

Claims priority, application Switzerland, Jul. 31, 1979, 7056/79

Int. Cl.³ D03D *3/00*

U.S. Cl. 428—245 **10 Claims**

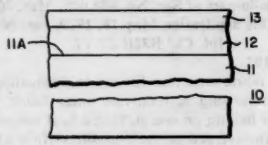
1. A fusible interlining for washable garments comprising at least one textile sheet-like structure which does not soften or melt at temperatures below 200° C. and a heat-sealable film consisting essentially of 50 to 75% by weight of a thermoplastic elastomer and 25 to 50% by weight of at least one modifier selected from the group consisting of homopolymers and copolymers of lower olefins; thermoplastic polymers of aromatic vinyl compounds selected from homopolymers of styrene, α-methylstyrene or vinyltoluene and copolymers of the said monomers with one another; and plasticizing hydrocarbon oils.

4,333,983

OPTICAL ARTICLE AND METHOD

Thomas H. Allen, Santa Rosa, Calif., assignor to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed Apr. 25, 1980, Ser. No. 143,592
Int. Cl.[3] B32B *27/06*; G02B *5/28*
U.S. Cl. 428—336 16 Claims



1. A transparent flexible polymer substrate carrying on at least one surface thereof a thin film adhesion layer of aluminum oxide formed to a thickness of at least about 170 nanometers and an optical coating comprising at least one thin film layer formed on said thin film adhesion layer of aluminum oxide and having preselected optical properties.

14. A method of forming an antireflection optical coating on a flexible polymer substrate comprising the steps of:

disposing a flexible polymer substrate in a vacuum deposition chamber;

depositing a thin film adhesion layer of aluminum oxide on at least one surface of said substrate to a thickness of at least about 170 nanometers; and

depositing an optical coating on said thin film adhesion layer of aluminum oxide.

4,333,984

HEAT-SENSITIVE RECORDING SHEETS

Akira Igarashi, and Hiroharu Matsukawa, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 18, 1980, Ser. No. 217,641
Claims priority, application Japan, Dec. 18, 1979, 54/164217
Int. Cl.[3] C09J *7/02*; G03C *1/52*
U.S. Cl. 428—336 12 Claims

1. A heat-sensitive recording sheet which comprises

a support,

a white or light-colored pigment coating layer having an oil absorption determined by JIS K5101 of 75 ml/100 g or more on the support, and

a heat-sensitive color forming layer comprising an electron donor colorless dye and an electron acceptor compound on said coating layer wherein recording occurs due to a color reaction upon melting one or both of said dye and said acceptor.

4,333,985

MAGNETIC RECORDING MEDIUM

Ryuji Shirahata; Akio Yanai, and Tatsuji Kitamoto, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 24, 1981, Ser. No. 257,286
Claims priority, application Japan, Apr. 24, 1980, 55-54609
Int. Cl.[3] B32B *15/08*
U.S. Cl. 428—336 3 Claims

1. A magnetic recording medium comprising a protective layer composed of at least one substance selected from the group consisting of poly(paraxylylene), poly(monochloroparaxylylene), and poly(dichloroparaxylylene), formed on a magnetic recording layer comprising a thin ferromagnetic metal film.

4,333,986

DIAMOND SINTERED COMPACT WHEREIN CRYSTAL PARTICLES ARE UNIFORMLY ORIENTATED IN A PARTICULAR DIRECTION AND A METHOD FOR PRODUCING THE SAME

Kazuo Tsuji; Shuji Yazu, and Akio Hara, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 10, 1980, Ser. No. 158,136
Claims priority, application Japan, Jun. 11, 1979, 54-73670; May 30, 1980, 55-73570
Int. Cl.[3] B22B *9/00*; C01B *31/06*
U.S. Cl. 428—402 3 Claims

1. A polycrystalline diamond sintered compact containing 5-30 weight % of a catalytic metal for synthesizing diamond from a carbonaceous raw material, said sintered compact being constituted by individual crystal particles each of which has a long axis more than 2 times the length of its short axis, the long axes of more than 50% of said crystal particles being uniformly oriented in the direction of the thickness of said sintered compact or in the direction normal thereto, said crystal particles forming a substantially continuous diamond phase by being bonded to each other in the direction of the long axes thereof.

4,333,987

METHODS FOR BONDING DISSIMILAR SYNTHETIC POLYMERIC MATERIALS AND THE PRODUCTS INVOLVED IN AND RESULTING FROM SUCH METHODS

Harold Kwart, 203 Cheltenham Rd., Newark, Del. 19711, and Seevaram N. Varadhachary, 401 Union St., Newtown, Pa. 18940

Filed Dec. 19, 1979, Ser. No. 105,051
Int. Cl.[3] B05D *3/06*
U.S. Cl. 428—419 25 Claims

1. A multi-layered construction of dissimilar synthetic polymeric materials comprising:

a first layer of a synthetic polymeric composition comprising a vinyl resin, at least one plasticizer for said vinyl resin, an organic unsaturated chemical compound soluble or dispersible in said vinyl resin synthetic polymeric composition and of sufficiently low volatility as not to be driven off during heat processing of said multi-layered construction, and a free radical producer or reaction initiator; and

a second layer of a synthetic polymeric composition comprising an ultraviolet-curable acrylated polyurethane resin and a polythiol capable of reacting with said organic unsaturated chemical compound in said first layer to form permanent primary chemical bonds bonding said layers together said first and second layers having been bonded together by reacting said organic unsaturated chemical compound and said polythiol.

15. A method of forming a multi-layered construction of dissimilar synthetic polymeric materials comprising:

forming a first layer of a synthetic polymeric composition comprising a vinyl resin, at least one plasticizer for said vinyl resin, an organic unsaturated chemical compound soluble or dispersible in said vinyl resin synthetic polymeric composition and of sufficiently low volatility as not to be driven off during heat processing of said multi-layered construction, and a free radical producer or reaction initiator;

forming a second layer of a synthetic polymeric composition comprising an ultraviolet-curable acrylated polyurethane resin and a polythiol capable of reacting with said organic unsaturated chemical compound in said first layer; and

exposing said first layer and said second layer to curing conditions, while in contact, for said ultraviolet-curable acrylated polyurethane resin, whereby said organic unsaturated chemical compound reacts with said polythiol to create strong and permanent primary chemical bonds between said layers.

4,333,988

MAGNETIC RECORDING MEDIA

Yasuyuki Yamada; Kenichi Masuyama, and Tatsuji Kitamoto, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 11, 1979, Ser. No. 74,469
Claims priority, application Japan, Sep. 11, 1978, 53-111581
Int. Cl.³ G11B *5/70*
U.S. Cl. 428—425.9 **24 Claims**

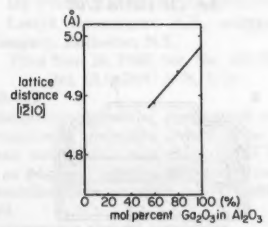
1. In a magnetic recording medium comprising a non-magnetic support and a recording layer comprising a finely divided ferromagnetic powder dispersed in a binder, the improvement wherein said binder comprises a 2-chloroacrylonitrile polymer and a polyurethane prepolymer having at least two terminal isocyanate groups.

4,333,989

SAPPHIRE SINGLE CRYSTAL SUBSTRATE CONSISTING ESSENTIALLY OF GA_2O_3 FOR SEMICONDUCTOR DEVICES

Jun-Ichi Nishizawa, and Kitsuhiro Kimura, both of Sendai, Japan, assignors to Semiconductor Research Foundation, Sendai, Japan

Continuation of Ser. No. 947,851, Oct. 2, 1978, abandoned, which is a division of Ser. No. 625,527, Oct. 24, 1975, Pat. No. 4,126,731. This application Feb. 22, 1982, Ser. No. 167,757
Claims priority, application Japan, Oct. 26, 1974, 49/123616
Int. Cl.³ C30B *29/20*
U.S. Cl. 428—446 **3 Claims**



1. A grown crystal structure comprising a sapphire-containing rhombohedral single-crystal electrically insulating substrate and an epitaxially grown semiconductor layer of silicon on said substrate, said single-crystal electrically insulating substrate consisting essentially of GA_2O_3 in an amount of between 71 and 98 mol % with the balance being essentially Al_2O_3, whereby the lattice misfit coefficient between said substrate and said epitaxially grown silicon layer is not more than about 1% along the axis of said substrate.

4,333,990

HEAT-SENSITIVE RECORDING PAPER

Noboru Yamato, and Tosimi Satake, both of Tokyo, Japan, assignors to Jujo Patper Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 68,444, Aug. 21, 1979, abandoned. This application Dec. 31, 1980, Ser. No. 221,793
Claims priority, application Japan, Aug. 25, 1978, 53-104163
Int. Cl.³ B41M *5/18*
U.S. Cl. 428—531 **5 Claims**

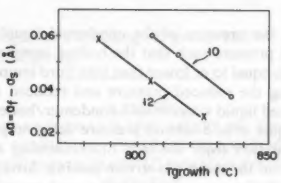
1. A heat-sensitive recording paper containing a colorless or pale-colored chromogenic dyestuff and a phenolic substance in the color-developing layer thereof, characterized in that said color-developing layer contains 20–65 weight % of filler of aluminum hydroxide with respect to the total weight of the color developing layer.

4,333,991

MAGNETIC GARNET FILM AND MANUFACTURING METHOD THEREFOR

Yoshifumi Sakurai, Minoo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1981, Ser. No. 258,005
Claims priority, application Japan, May 1, 1980, 55-58400
Int. Cl.³ C04B *35/40*; C30B *29/28*
U.S. Cl. 428—702 **9 Claims**



8. A magnetic garnet film having a composition selected from the group consisting of $(BiGdLu)_3(FeAl)_5O_{12}$ and $(BiGdSm)_3(FeAl)_5O_{12}$, said garnet film being composed of a single crystal grown on a substrate having a composition selected from the group consisting of $Gd_3Ga_5O_{12}$, $Sm_3Ga_5O_{12}$ and $Nd_3Ga_5O_{12}$, and being multilayered with a photoelectric film.

4,333,992

METHOD FOR PRODUCING STEAM FROM THE LIQUID IN A MOIST GAS STREAM

Herbert C. Healy, Hebron, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 30, 1980, Ser. No. 202,049
Int. Cl.³ H01M *8/04*
U.S. Cl. 429—17 **7 Claims**

1. In a power producing plant comprising primary electricity generating means and cogeneration means, wherein said primary electricity generating means produces a moist gas stream containing high quality waste heat at a first pressure and first temperature which is well above the dew point of said stream, and wherein said cogeneration means derives at least part of its energy from high quality waste heat from said primary electricity generating means, and wherein said power plant requires a supply of steam, a method for removing water from said moist gas stream and converting said water to said steam required by said power plant comprising the steps of:

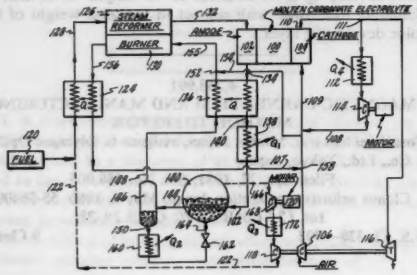
reducing the temperature of said moist gas stream to a second temperature which is still above the dew point of said stream by using the said high quality heat within said moist gas stream to provide energy for said cogeneration means;

introducing said moist gas stream at said second temperature into a condenser/boiler;

condensing water from the gas stream in the condenser/-boiler by cooling the gas stream to a third temperature which is below the stream's dew point without significantly reducing the pressure of the gas stream to produce liquid water at said third temperature and at a pressure which is substantially the same as the pressure of the moist gas stream entering the condenser/boiler;

separating the condensed liquid water from the gas stream;

reducing the temperature of the condensed liquid water from said third temperature to a lower, fourth temperature;



reducing the pressure of the condensed liquid water to a second pressure such that the boiling temperature of the water is equal to or lower than said third temperature; and

vaporizing the reduced pressure and reduced temperature separated liquid water in said condenser/boiler by heating said liquid at said second pressure using only the heat of condensation from the step of condensing and sensible heat from the moist gas stream passing through said condenser/boiler to produce steam at said second pressure.

4,333,993

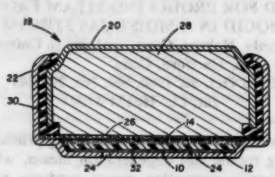
AIR CATHODE FOR AIR DEPOLARIZED CELLS

Henry F. Gibbard, Schaumburg, Ill., assignor to Gould Inc., Rolling Meadows, Ill.

Continuation of Ser. No. 189,159, Sep. 22, 1980, abandoned. This application Jul. 10, 1981, Ser. No. 282,311

Int. Cl.³ H01M 4/00

U.S. Cl. 429—27 **14 Claims**



1. A gas depolarized electrochemical cell comprising a cell casing having means allowing oxygen ingress therein, an anode and a cathode disposed in the casing, a separator interposed between the anode and cathode, a current collector and an electrolyte, said cathode consisting of a unitary member having a hydrophobic surface portion and a hydrophilic surface portion consisting of an ion-exchange portion having dispersed therein catalyst particles in an amount sufficient to carry out the desired oxygen reduction, the hydrophobic surface portion of the cathode being positioned to contact the ingressing oxygen.

8. An air cathode for use in an air depolarized cell which consists of a unitary member having a hydrophobic surface portion and a hydrophilic surface portion consisting of an ion-exchange portion having dispersed therein catalyst particles to reduce oxygen.

4,333,994

CELL EMPLOYING A COILED ELECTRODE ASSEMBLY

Lewis F. Urry, Columbia Station, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 27, 1981, Ser. No. 248,216

Int. Cl.³ H01M 6/10

U.S. Cl. 429—94 **13 Claims**

1. An electrochemical cell comprising a coiled electrode assembly disposed within a container closed by a cover, said coiled electrode assembly comprising an elongated first electrode strip, an elongated second electrode strip and a separator, all of which are helically wound about each other so that the separator is interposed between said first electrode strip and said second electrode strip, the improvement wherein the portion of at least one of the wound electrodes that is not sandwiched between layers of the other wound electrode has an average thickness that is no greater than 80% of the average thickness of the portion of said at least one wound electrode that is sandwiched between layers of the other wound electrode.

4,333,995

LEAK PROOF CELLS PROVIDED WITH A SYNTHETIC RESIN GASKET HAVING AN INCREASED DEGREE OF CRYSTALLINITY

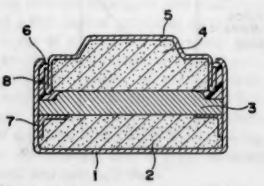
Osamu Ishida, Suita; Yoshio Uetani, Ibaraki, and Seiichi Matsushima, Toyonaka, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Jun. 27, 1980, Ser. No. 163,512

Claims priority, application Japan, Jun. 28, 1979, 54/81805; Jun. 28, 1979, 54/81806; Jun. 28, 1979, 54/81807; Jun. 28, 1979, 54/81808

Int. Cl.³ H01M 2/08

U.S. Cl. 429—172 **13 Claims**



1. A leak-proof cell comprising a positive can and a negative collector fitted in the opening of the positive can, a gasket made of a synthetic resin being set in the space between the positive can and the negative collector to prevent the leakage of any liquid material in the cell, characterized in that the degree of crystallinity of the gasket set in the cell is at least 10% higher than that of the gasket immediately after molding.

4,333,996

SOLID STATE CELL IN WHICH AN INERT NONCONDUCTIVE MATERIAL IS DISPERSED IN THE CATHODE

Demetrios V. Louzos, Rocky River, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 29, 1980, Ser. No. 191,521
Int. Cl.³ H01M 6/18
U.S. Cl. 429—191 8 Claims

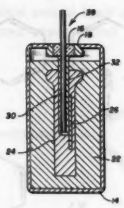
1. A solid state cell comprising an anode, a solid electrolyte and a charge transfer complex cathode in which the complex is the reaction product of an organic electron donor selected from the group consisting of poly-2-vinyl-pyridine, mesophase pitch, poly(N-vinylpyrrolidone), anthracene and naphthalene and an electron acceptor of at least one halogen; the improvement wherein a minimum amount of at least one chemically inert, high surface area, electrically nonconductive material in particulate form is dispersed in the cathode.

4,333,997

LITHIUM-HALOGEN BATTERIES

Lee F. Athearn, Fridley, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Division of Ser. No. 68,872, Aug. 22, 1979, Pat. No. 4,292,346, which is a division of Ser. No. 20,809, Mar. 15, 1979, Pat. No. 4,212,930. This application Aug. 29, 1980, Ser. No. 182,650
Int. Cl.³ H01M 4/40
U.S. Cl. 429—218 6 Claims



1. A lithium electrode comprising a collector body alternately overlayed with lithium in two forms: one form comprising a hot-dipped lithium coating, the other form comprising a plurality of pressed lithium pieces.

4,333,998

RADIATION-CURABLE COMPOSITION FOR RESTORATIVE AND/OR PROTECTIVE TREATMENT OF PHOTOGRAPHIC ELEMENTS

Gerald M. Leszyk, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 24, 1980, Ser. No. 209,799
Int. Cl.³ G03C 1/76, 5/26
U.S. Cl. 430—12 38 Claims

1. A radiation-curable coating composition which is useful for the formation of protective overcoats on photographic elements, said composition comprising (1) an acrylated urethane, (2) an aliphatic ethylenically-unsaturated carboxylic acid, (3) a multifunctional acrylate, and (4) a siloxy-containing polycarbinol.

10. A photographic element comprising

(1) a support,

(2) at least one image-bearing layer, and

(3) a protective overcoat layer which is permanently bonded to the support side of said element; said protective overcoat layer having been formed by (a) coating said support side with a radiation-curable coating composition which forms a transparent, flexible, scratch-resistant, crosslinked polymeric layer upon radiation curing, said coating composition comprising (1) an acrylated urethane, (2) an aliphatic ethylenically-unsaturated carboxylic acid, (3) a multifunctional acrylate, and (4) a siloxy-containing polycarbinol, and (b) subjecting said coating to radiation sufficient to cure said coating and bond it to said support side.

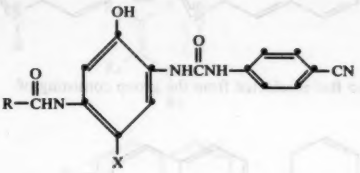
4,333,999

CYAN DYE-FORMING COUPLERS

Philip T. S. Lau, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 85,140, Oct. 15, 1979, abandoned. This application Jul. 10, 1980, Ser. No. 168,831
Int. Cl.³ G03C 1/40
U.S. Cl. 430—17 20 Claims

15. A processed photographic element containing a cyan dye image comprised of a cyan dye obtained by coupling of oxidized silver halide color developing agent and a cyan dye-forming coupler having the structure:



wherein:

X is hydrogen or a coupling-off group; and

R is a ballast group.

4,334,000

CYANINE AND DIANE DYE MIXTURE PROVIDES NEAR I. R. SENSITIVE, CHARGE TRANSPORT LAYER, ELECTROPHOTOGRAPHIC PHOTOCONDUCTIVE ELEMENT

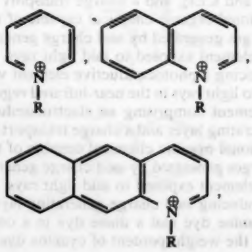
Mike S. H. Chang, Danbury; John T. Donoghue, Trumbull, and Peter G. Edelman, Westport, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 19, 1980, Ser. No. 218,389
Int. Cl.³ G03G 5/14
U.S. Cl. 430—58 16 Claims

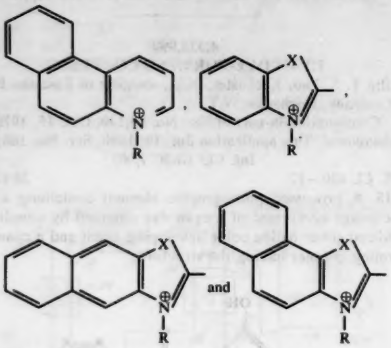
1. A photoconductive element which is extremely sensitive to exposure to light rays in the near-infrared region of the spectrum, said element comprising an electroconductive support, a charge generating layer comprising a mixture of at least one cyanine dye and at least one diane dye in which the weight percent of cyanine dye relating to the total weight of said dye mixture ranges between about 0.05% and 50.0%, said cyanine dye having a general structure of the basic moiety as follows:

$$(A—(CH=CH)_n CH=B)\ Z^-$$

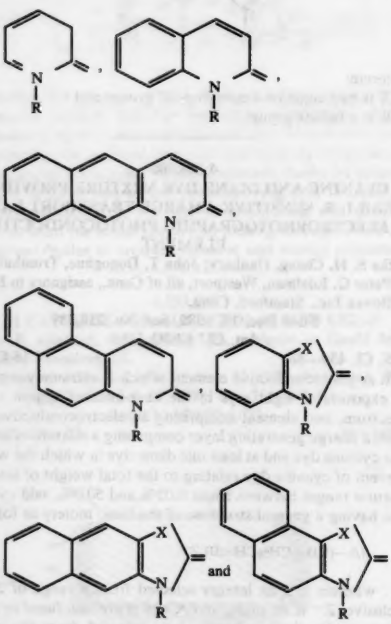
. . . wherein n is an integer selected from a range of 2 to 4 inclusive, Z^- is an anion, and A and B are non-fused or fused hetero-cyclic rings, wherein A is selected from the group consisting of:



-continued

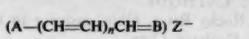


. . . and B= is selected from the group consisting of:

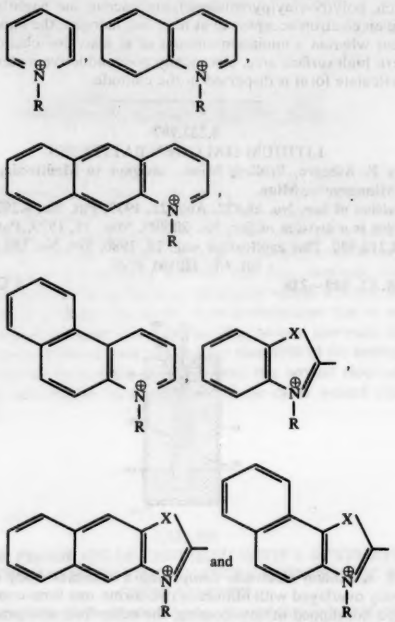


. . . wherein R is selected from the group alkyl, substituted alkyl and aryl groups and X is selected from the group S, Se, O, NMe, NEt, CMe_2 and CEt_2, and a charge transport layer comprising a conventional organic chemical capable of transporting electrical charges generated by said charge generating layer in areas of said element exposed to said light rays.

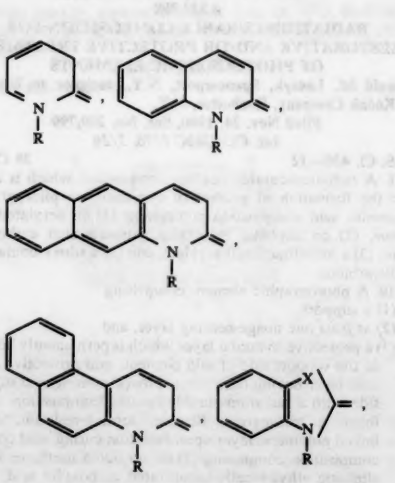
9. Process for producing a photoconductive element which is extremely sensitive to light rays in the near-infrared region of the spectrum, said element comprising an electroconductive support, a charge generating layer and a charge transport layer comprising a conventional organic chemical capable of transporting electrical charges generated by said charge generating layer in areas of said element exposed to said light rays, comprising the step of producing said charge generating layer by mixing together a cyanine dye and a diane dye in a coating composition in which the weight percent of cyanine dye relative to the total weight of said dye mixture ranges between about 0.05% and 50.0%, said cyanine dye having a general structure of the basic moiety as follows:



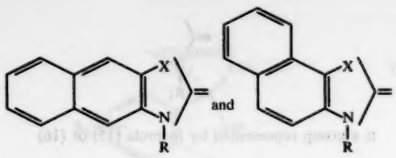
. . . wherein n is an integer selected from a range of 2 to 4 inclusive, Z^- is an anion, and A and B are non-fused or fused hetero-cyclic rings, wherein A is selected from the group consisting of:



. . . and B= is selected from the group consisting of:



-continued



. . . wherein R is selected from the group alkyl, substituted alkyl and aryl groups and X is selected from the group S, Se, O, NMe, NEt, CMe_2 and CEt_2, and applying said composition as a uniform thin layer.

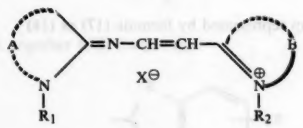
4,334,001

AZACYANINE SPECTRA SENSITIZED ORGANIC PHOTOCONDUCTIVE COMPOSITIONS AND ELEMENTS

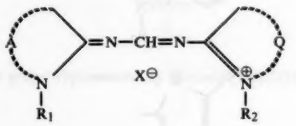
Seiji Horie, and Hideo Sato, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 8, 1980, Ser. No. 214,157
Claims priority, application Japan, Dec. 7, 1979, 54-158148
Int. Cl.³ G03G 5/09
U.S. Cl. 430—83 **9 Claims**

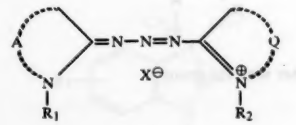
1. A photoconductive composition comprising an organic photoconductive substance and at least one spectral sensitizer selected from azacyanines represented by formula (I), (II), (III), (IV), or (V)



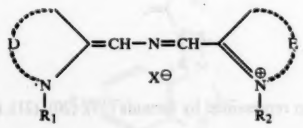
(I)



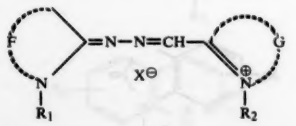
(II)



(III)



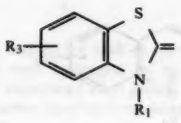
(IV)



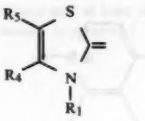
(V)

wherein A, together with the group

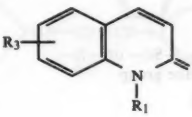
is a group represented by formula (1), (2), (3), or (4)



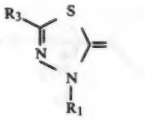
(1)



(2)



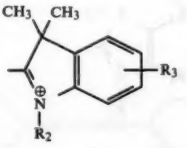
(3)



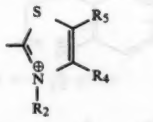
(4)

B, together with the group

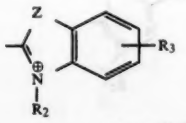
is a group represented by formula (5), (6), (7), (8), (9), or (10)



(5)

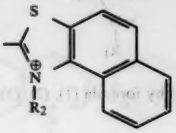


(6)

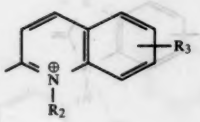


(7)

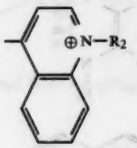
-continued



(9)



(10)

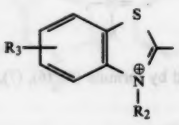


wherein Z is —O—, —Se— or —S—;

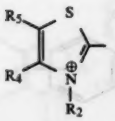
Q, together with the group

is a group represented by formula (11), (12), (13) or (14)

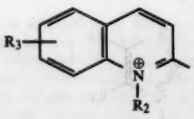
(11)



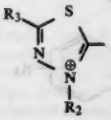
(12)



(13)



(14)

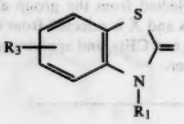


D, together with the group

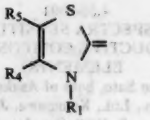
(8)

is a group represented by formula (15) or (16)

(15)



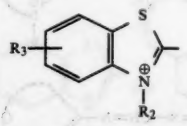
(11)



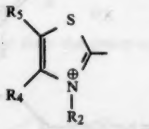
E, together with the group

is a group represented by formula (17) or (18)

(17)



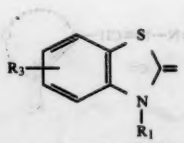
(18)



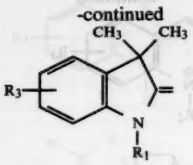
F, together with the group

is a group represented by formula (19), (20), (21), (22), or (23)

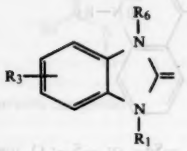
(19)



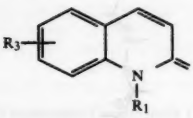
-continued



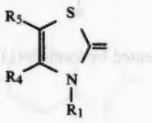
(20)



(21)



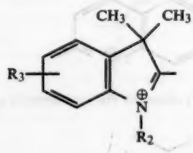
(22)



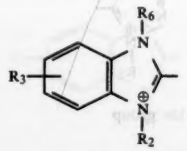
(23)

G, together with the group

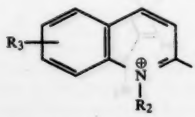
is a group represented by formula (24), (25), (26), or (27)



(24)

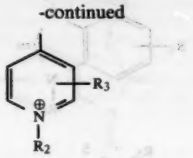


(25)



(26)

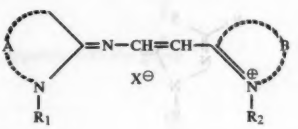
-continued



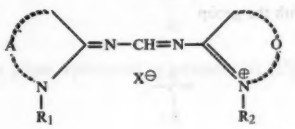
(27)

and R_1, R_2, and R_6 are each an alkyl group, and R_3, R_4, and R_5 are each hydrogen, an alkyl group, an alkoxy group, or a substituted alkyl group.

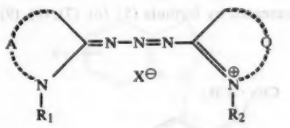
7. A photosensitive member comprising a melt-extruded film of a photoconductive composition comprising an organic photoconductive substance and at least one spectral sensitizer selected from azacyanines represented by formula (I), (II), (III), (IV), or (V)



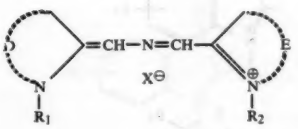
(I)



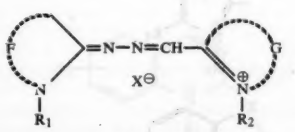
(II)



(III)



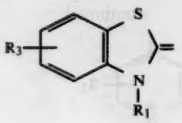
(IV)



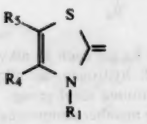
(V)

wherein A, together with the group

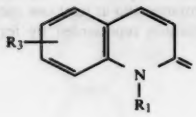
is a group represented by formula (1), (2), (3) or (4)



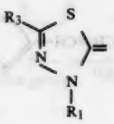
(1)



(2)



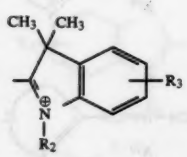
(3)



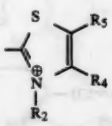
(4)

B, together with the group

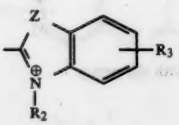
is a group represented by formula (5), (6), (7), (8), (9), or (10)



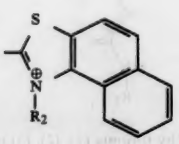
(5)



(6)

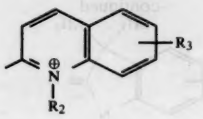


(7)

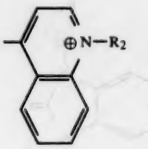


(8)

-continued



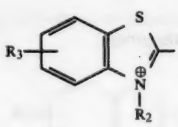
(9)



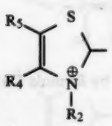
(10)

wherein Z is —O—, —Se— or —S—; Q, together with the group

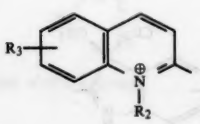
is a group represented by formula (11), (12), (13), or (14)



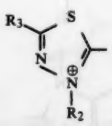
(11)



(12)

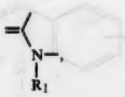


(13)

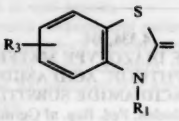


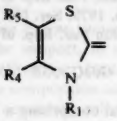
(14)

D, together with the group



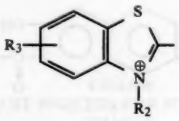
is a group represented by formula (15) or (16)

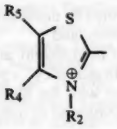

(15)


(11)

E, together with the group

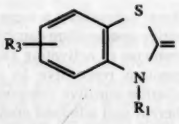
is a group represented by formula (17) or (18)

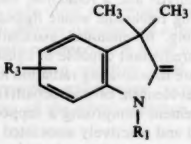

(17)


(18)

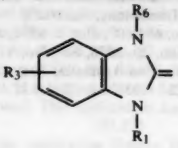
F, together with the group

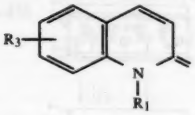
is a group represented by formula (19), (20), (21), (22), or (23)

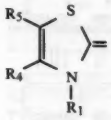

(19)


(20)

-continued

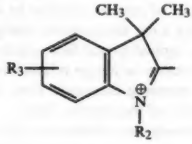

(21)

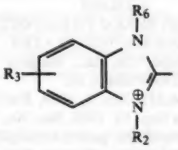

(22)

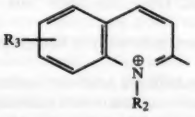

(23)

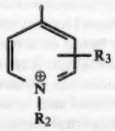
G, together with the group

is a group represented by formula (24), (25), (26), or (27)


(24)


(25)


(26)


(27)

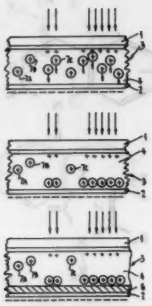
and R_1, R_2, and R_6 are each an alkyl group, and R_3, R_4, and R_5 are each hydrogen, an alkyl group, an alkoxy group, or a substituted alkyl group.

4,334,002

IMAGE DEVELOPMENT METHOD

Rodger D. Bouette, Somerville, Australia, assignor to Repco Research Pty. Ltd., Dandenong, Australia

Continuation of Ser. No. 691,607, Jun. 1, 1976, abandoned. This application Jun. 20, 1978, Ser. No. 917,366
Claims priority, application Australia, Jun. 4, 1975, PC 1864
Int. Cl.³ G03G 13/10, 13/22
U.S. Cl. 430—103 9 Claims



1. A method of electrographically forming a printable image using an electrographic plate having an imaging face closely spaced from an opposing electrode comprising the steps of: applying a voltage to said imaging face and to said opposing electrode producing an electric field extending from said imaging face to said opposing electrode; illuminating said plate with an image to generate a voltage pattern on said face; and passing a developer fluid between the face and said opposing electrode; the improvement comprising entraining a printing medium within said developer fluid to be placed thereby within said electric field in out of contact relation to said face, said printing medium having a net electrostatic charge of the same polarity as the voltage applied to said face which causes migration of the printing medium in image relation to said voltage pattern towards the opposing electrode from the developer fluid under the influence of the electric field.

4,334,003

ULTRA HIGH SPEED PRESENSITIZED LITHOGRAPHIC PLATES

Thomas H. Jones, Naperville, Ill., assignor to Richardson Graphics Company, Des Plaines, Ill.

Division of Ser. No. 44,531, Jun. 1, 1979, Pat. No. 4,263,392. This application Sep. 18, 1980, Ser. No. 188,292
The portion of the term of this patent subsequent to Apr. 21, 1998, has been disclaimed.
Int. Cl.³ G03C 1/54, 1/71; G03F 7/08, 7/16
U.S. Cl. 430—156 21 Claims

1. An ultra high speed presensitized lithographic plate comprising:

a backing member including a substrate surface exhibiting a propensity for adhesion of diazonium materials thereto; and

a photosensitive negative-working diazonium material selected from the group consisting of a diazonium compound and a diazonium resin layer adhered to said substrate surface, said diazonium material layer being of a residual thickness and having been formed by extraction from an initial diazonium layer coated onto said substrate surface and having more diazonium material than that of said residual thickness diazonium layer, said residual thickness diazonium layer including a quantity of diazonium material sufficient to form a lithographic image on the plate when subjected to ultra high speed exposure conditions, said residual thickness of the diazonium material layer including a quantity of diazonium material of not much greater than about 0.05 mg of diazonium material per square foot of substrate surface.

4,334,004

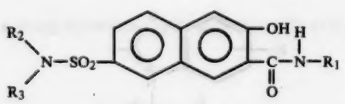
LIGHT-SENSITIVE DIAZOTYPE MATERIAL WITH 2-HYDROXY-3-NAPHTHOIC ACID AMIDES HAVING 6-SULFONIC ACID AMIDE SUBSTITUTION

Siegfried Scheler, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 16, 1979, Ser. No. 21,104
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1978, 2811981
Int. Cl.³ G03C 1/58, 1/54
U.S. Cl. 430—176 10 Claims

1. In a diazotype material comprising a light-sensitive layer on a support, said layer containing at least one photosensitive diazonium compound from the group consisting of (1) unilaterally diazotized p-phenylene diamine with alkoxy group in positions 2 and 5 relative the diazonium radical; (2) p-mercapto benzene diazonium compound; (3) p-phenyl benzene diazonium compound; (4) p-acylamino benzene diazonium compound; and (5) 6-chloro-4-dimethylamino-3(4-chlorophenoxy)-benzene diazonium compound at least one coupling component, a binder, and an acid stabilizer,

the improvement that the coupling component is at least one 2-hydroxy-3-naphthoic acid amide of the general formula



wherein

R_1 is hydrogen, a substituted or unsubstituted alkyl, cycloalkyl, aralkyl or aryl group, and

R_2 and R_3 are identical or different and are hydrogen, a substituted or unsubstituted alkyl, cycloalkyl, aralkyl or aryl group, or together with the nitrogen atom to which they are attached, a substituted or unsubstituted heterocyclic group.

4,334,005

TRANSITION METAL PHOTOREDUCTION SYSTEMS AND PROCESSES

Anthony Adin, Rochester, and James C. Fleming, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 720,873, Sep. 7, 1976, Pat. No. 4,201,588, which is a continuation-in-part of Ser. No. 618,186, Sep. 30, 1975, abandoned, which is a continuation-in-part of Ser. No. 461,057, Apr. 15, 1974, abandoned. This application Mar. 15, 1979, Ser. No. 20,898
Int. Cl.³ B03C 1/727; G03C 1/72
U.S. Cl. 430—211 6 Claims

1. In an imaging element comprising a support, and on the support a radiation-sensitive composition capable of imagewise generating amines in response to activating radiation, and an image-recording composition responsive to said amines in admixture with said radiation-sensitive composition;

the improvement wherein said admixed compositions comprise o-phthalaldehyde and a reducible, inert cobalt(III)-complex containing releasable amine ligands;

and further including, in chemical association with said complex, a photoreductant capable of causing the reduction, upon exposure to activating radiation longer than 300 nanometers in wavelength, of said cobalt(III)complex.

2. In an imaging element comprising a support, and on the support, in superposed and reactively associated layers, a layer of a radiation-sensitive composition capable of imagewise

generating amines in response to activating radiation and comprising a reducible inert cobalt(III)complex containing releasable amine ligands, and a layer of an image-recording composition responsive to said amines;

the improvement wherein said radiation-sensitive composition further includes a photoreductant capable of causing the reduction, upon exposure to activating radiation longer than 300 nanometers in wavelength, of said cobalt-(III)complex;

and wherein said image-recording composition comprises o-phthalaldehyde.

3. In an imagewise exposed imaging element comprising a support, and on the support, in superposed and reactively associated layers, a first layer containing in the exposed portions of said layer, a composition comprising a reducible, inert cobalt(III)complex containing releasable amine ligands, and a second layer of an image-recording composition;

the improvement wherein said composition further includes, in said exposed portions, a reducing agent for said cobalt-(III)complex produced from the exposure of a photoreductant to radiation longer than 300 nm in wavelength,

and wherein said image-recording composition comprises o-phthalaldehyde.

4,334,006

PEEL-APART PROCESS FOR FORMING RELIEF IMAGES

Masao Kitajima; Hiromichi Tachikawa; Fumiaki Shinozaki, and Tomoaki Ikeda, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 966,990, Dec. 6, 1978, abandoned. This application Apr. 14, 1980, Ser. No. 139,623

Claims priority, application Japan, Dec. 6, 1977, 52-145685

The portion of the term of this patent subsequent to Jul. 8, 1997, has been disclaimed.

Int. Cl.³ G03C *11/12, 5/00, 5/18*

U.S. Cl. 430—254 **17 Claims**

1. The process for forming an image, which comprises imagewise exposing a photo-sensitive image-forming material comprising a support having formed thereon a layer of a photo-sensitive composition containing an o-quinonediazide compound and a thermoplastic binder, said photo-sensitive composition being solid and not adhesive at ordinary temperatures, but softenable upon heating, heating the exposed photo-sensitive material in intimate contact with a peeling development carrier sheet which has no adhesive coating and which is nontacky at ordinary temperature to a temperature above the softening temperature of the photo-sensitive composition, the heating temperature being high enough to obtain sufficient adhesion between the photo-sensitive composition and the peeling development carrier sheet such that quality images can be peeled from the support but low enough that the photo-sensitive composition and the peeling development carrier sheet are not softened to the point at which good image quality is not obtained, and peeling the carrier sheet and the image-forming material from each other at a temperature below said heating temperature to thereby transfer and adhere the exposed area of the photo-sensitive composition layer to the carrier sheet and simultaneously form a negative relief image on the carrier sheet, and a positive relief image corresponding to the non-transferred area of the photo-sensitive composition layer on the support.

4,334,007

PROCESS OF MAKING AN OPTICALLY RECORDABLE AND READABLE INFORMATION CARRIER AND THE CARRIER OBTAINED BY THIS PROCESS

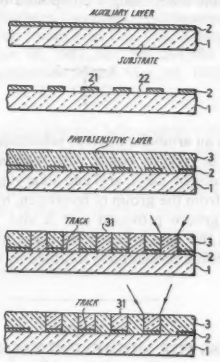
Claude Tinet, and Claire Lemonon, both of Paris, France, assignors to Thomson-Brandt, Paris, France

Division of Ser. No. 189,222, Sep. 22, 1980, Pat. No. 4,288,510, which is a division of Ser. No. 42,450, May 25, 1979, Pat. No. 4,252,889, which is a continuation of Ser. No. 835,282, Sep. 20, 1977, abandoned. This application Apr. 13, 1981, Ser. No. 253,273

Claims priority, application France, Sep. 24, 1976, 76 28771

Int. Cl.³ G03C *1/76*

U.S. Cl. 430—270 **3 Claims**



1. An optically recordable and readable video disc or tape for use in an information storage system of the type comprising optical means for producing focussed reading and recording radiation beams to be projected onto said video disc or tape, and servocontrol means for maintaining said optical means and said video disc or tape in proper registry, said video disc or tape comprising:

a substrate;

a radiation sensitive layer covering said substrate; and

an auxiliary layer covering said radiation sensitive layer and comprising a continuous recording track formed by a smooth groove being made in said auxiliary layer exposing a continuous track of said radiation sensitive layer following a predetermined configuration,

said continuous track being optically trackable by said optical servocontrol means, and

the track being recordable with elements of information by irradiating said radiation sensitive layer with said focussed recording radiation beam modulated by elements of information to be recorded to cause the formation of optically detectable structural changes in the structure of said radiation sensitive layer,

said continuous track and said information being distinctly detectable by optical reading means sensitive to said optical-structural changes, and

said track being detectable even in the absence of recorded information.

4,334,008

PHOTOSENSITIVE COMPOSITIONS OF POLYMER POLYNITRATE ESTER AND BASIC AROMATIC AMINE

John F. Rice, Nashua, N.H.; Albert P. Yundt, Medfield, Mass., and Kenneth J. Quast, Milford, N.H., assignors to Bard Laboratories, Inc., Amherst, N.H.

Continuation of Ser. No. 734,649, Oct. 21, 1976, abandoned, which is a continuation of Ser. No. 560,565, Mar. 20, 1975, abandoned. This application May 29, 1980, Ser. No. 154,313

Int. Cl.[3] G03C *1/68*

U.S. Cl. 430—270 62 Claims

1. A photosensitive imaging system suitable for producing an image in response to exposure to electromagnetic radiation, consisting essentially of a molecularly intimate and homogeneous admixture of at least one basic, aromatic amine and an oxidizer which oxidizes the basic aromatic amine on said exposure of said system to electromagnetic radiation, said oxidizer consisting essentially of a polymer polynitrate ester having a viscosity in the range of about 0.1 to about 5000 seconds, the aromatic amine comprising a compound of the following formula:

wherein R is an aromatic nucleus substituted either directly or by nitrogen or oxygen bonds with members of the group of hydrogen, halogen, alkyl, aryl and alkaryl groups, and X and Y are selected from the group of hydrogen, hydroxyl, alkyl, aryl, and alkaryl groups provided that X and Y are not both hydroxyl, such that said aromatic amine is relatively basic, such basicity not being substantially nullified by salt or amide formation.

4,334,009

PROCESS FOR MODIFYING TACKY SURFACES

Magalie M. Charles, Staten Island, N.Y., and Robert B. Heiart, Middletown, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 23, 1980, Ser. No. 189,829

Int. Cl.[3] G03C *7/40;* B05D *5/02*

U.S. Cl. 430—291 20 Claims

1. In a process for modifying a tacky surface by adhering particulate material thereto which comprises

(1) applying the particulate material to said tacky surface, and

(2) removing excess particulate material therefrom,

the improvement wherein prior to application to the tacky surface the particulate material is admixed with carrier particles which are removed with the excess particulate material, the ratio in the mixture of the average particle diameter of carrier particles to that of the particulate material in the mixture being greater than 2 and the weight ratio of particulate material to carrier particles being less than 1.

4,334,010

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE ELEMENT

Hiroyuki Mifune; Shoji Ishiguro; Tadao Shishido; Yoshiharu Fuseya, all of Minami-ashigara, and Teruaki Tsujikawa, Otsu, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

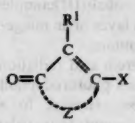
Filed Jul. 17, 1981, Ser. No. 284,164

Claims priority, application Japan, Jul. 17, 1980, 55-97934

Int. Cl.[3] G03C *1/34*

U.S. Cl. 430—551 27 Claims

1. A silver halide photographic light-sensitive element comprising a support having thereon at least one silver halide emulsion layer, wherein at least one compound represented by formula (I) is incorporated in the silver halide emulsion layer or in another hydrophilic colloid layer:



(I)

wherein X represents a hydroxy group or a group represented by

wherein R^2 and R^3 each represents hydrogen, an alkyl group, or an aryl group; R^1 represents a sulfur-containing saturated heterocyclic group or a group represented by -A-S-B, wherein A represents an alkylene group and B represents hydrogen, an alkyl group, or an aryl group; and Z represents an atomic group forming a 5-membered or 6-membered unsubstituted or substituted carbocyclic ring.

4,334,011

COLOR PHOTOGRAPHIC LIGHT SENSITIVE MATERIALS

Kozo Aoki; Yoshio Seoka, and Yukio Yokota, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

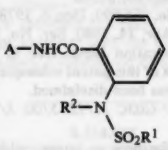
Filed Dec. 5, 1980, Ser. No. 213,513

Claims priority, application Japan, Dec. 5, 1979, 54-157729

Int. Cl.[3] G03C *1/40*

U.S. Cl. 430—552 11 Claims

1. A color photographic silver halide light sensitive material comprising a cyan dye forming coupler represented by formula (I)



(I)

wherein A represents a cyan coupler residue, but the —NHCO group does not bond to A in the active position of A, R^1 represents a substituted or unsubstituted alkyl group or aryl group, R^2 represents hydrogen or a substituted or unsubstituted alkyl group, and the various positions of the phenyl group of the formula (I) may be substituted with from 1 to 3 substituents selected from the group consisting of hydrogen, a halogen atom, an alkyl group, or an alkoxy group.

4,334,012

SILVER HALIDE PRECIPITATION PROCESS WITH DELETION OF MATERIALS

Andre G. E. Mignot, Bonneuil-sur-Marne, France, assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 215,890, Dec. 12, 1980, abandoned, which is a continuation-in-part of Ser. No. 116,685, Jan. 30, 1980, abandoned. This application Jul. 6, 1981, Ser. No. 280,625

Int. Cl.[3] G03C *1/02*

U.S. Cl. 430—567 27 Claims

1. In a process comprising

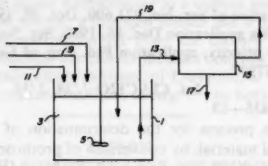
forming a radiation-sensitive silver halide dispersion by reacting silver and halide salts in solution, wherein the silver and halide salts are reacted to form silver halide

grain nuclei in the presence of a dispersing medium and silver halide grain growth is allowed to proceed in a reaction vessel in which the silver halide grain nuclei and the dispersing medium are present,

the improvement comprising, while increasing the silver halide present in the dispersing medium during silver halide grain growth, reducing the volume of the dispersion by separating a portion of the dispersing medium while retaining the silver halide grains within the dispersion remaining.

2. In a double-jet batch process comprising

forming a radiation-sensitive silver halide dispersion by reacting a silver salt solution and a halide salt solution within a dispersing medium to achieve silver halide grain



nucleation followed by silver halide grain growth, wherein during silver halide grain growth the silver and halide salts are concurrently run into a reaction vessel containing the dispersing medium,

the improvement comprising, while running the silver and halide salt solutions and during silver halide grain growth, withdrawing a portion of the dispersion from the reaction vessel,

reducing the volume of the withdrawn dispersion by separating a portion of the dispersing medium while retaining the silver halide grains within the remaining withdrawn dispersion, and

returning the remaining withdrawn dispersion to the reaction vessel.

4,334,013

USE OF COPOLYMERS IN THE PRODUCTION OF PHOTOGRAPHIC EMULSIONS AND PHOTOGRAPHIC MATERIALS

Peter Bergthaller, and Helmut Sommer, both of Cologne, Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Nov. 12, 1980, Ser. No. 206,155

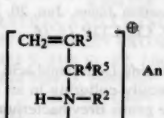
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1979, 2946465

Int. Cl.³ G03C *1/72*

U.S. Cl. 430—569 **7 Claims**

1. A photographic material comprising a support and at least one photosensitive silver halide emulsion layer on said support comprising a peptizing agent and at least one silver halide wherein the improvement comprises said photosensitive layer includes a peptizing agent comprised of a copolymer of at least the following polymerized compounds:

(1) An allyl ammonium salt corresponding to the following formula



(A)

in which

R^1 and R^2 which may be the same or different, represent hydrogen; an aliphatic, araliphatic or cycloaliphatic radical which may be substituted, or R^1 and R^2 may together represent the atoms required to complete a 5- to 7-membered ring;

R^3, R^4 and R^5 which may be the same or different, represent hydrogen or an alkyl radical which may be substituted;

An represents an anion and/or

R^3 represents the radical $(—CR^5R^4—NR^1R^2H)^+An$;

(2) a monomer B containing at least one anionic group; and

(3) at least 40 mole percent of a compound C which is acrylamide and/or methacrylamide; wherein the copolymer has a molecular weight of from 10,000 to 200,000 and the polymer is present in a quantity of from 500 mg to 500 g per mole of silver halide.

4,334,014

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE ELEMENTS

Hiroyuki Mifune; Tadao Shishido; Shoji Ishiguro, all of Minami-ashigara, and Jisaburo Ueyanagi, Nishinomiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

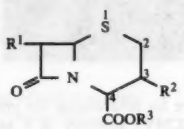
Filed Mar. 18, 1981, Ser. No. 244,993

Claims priority, application Japan, Mar. 18, 1980, 55-34379

Int. Cl.³ G03C *1/34*

U.S. Cl. 430—611 **10 Claims**

1. A silver halide photographic light-sensitive element comprising a support, at least one silver halide emulsion layer which is substantially of the surface latent image type, and at least one hydrophilic colloid layer, wherein at least one of the silver halide emulsion layer and the hydrophilic colloid layer contains a cephalosporin compound in an amount sufficient to reduce latent image regression, wherein the cephalosprin compound has the following formula:



(I)

wherein

R^1 represent an amino group;

R^2 can represent hydrogen, a halogen group, an amino group, a hydroxy group, a mercapto group, an alkyl group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, an acyloxy group, an acylthio group, a heterocyclic group, or a formyl group; and

R^3 can represent hydrogen, an alkali metal ion, an ammonium ion, or a hydrocarbon or heterocyclic group which may be substituted; or

R^2 and R^3 together can represent a group completing an oxygen-containing heterocyclic group.

4,334,015

IMAGING COMPOSITIONS

Dean R. Yarian, Afton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 23, 1979, Ser. No. 41,693

Int. Cl.³ B01J *13/02*; B41M *5/16, 5/22*; C09D *11/00*; C09B *26/02*

U.S. Cl. 435—1 **36 Claims**

32. A system for forming colored markings from substantially colorless first and second coreactants comprising:

(a) a carrier means carrying a first color-forming coreactant, said first coreactant comprising an aromatic substituted hydrazone and a reaction-implementing cosolvent vehicle, said hydrazone having the formula

$$Ar^1-\overset{O}{\overset{\|}{C}}-NHN=CH-Ar^2$$

wherein Ar^1 and Ar^2 are independently selected aromatic substituents, Ar^1 being selected from the group of aromatic substituents consisting of phenyl, substituted phenyl, napthyl, and substituted naphthyl and Ar^2 being selected from the group of aromatic substituents consisting of o-hydroxy substituted phenyl and o-hydroxy substituted naphthyl,

(b) a record sheet having on at least a portion of one major surface a second coreactant comprising a transition metal salt,

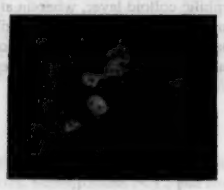
(c) transfer means for transferring at least a portion of said first coreactant to selected areas of said record sheet having said second coreactant.

4,334,016

HUMAN OSTEOGENIC SARCOMA CELL LINE AND USE THEREOF FOR IMMUNOFLUORESCENT ANTIBODY TEST

Toru Furukawa, Philadelphia, Pa., assignor to The Wistar Institute of Anatomy and Biology, Philadelphia, Pa.

Filed Jun. 19, 1980, Ser. No. 161,005
Int. Cl.[3] C12Q *1/70;* C12N *5/02*
U.S. Cl. 435—5 1 Claim



1. A test procedure for determining the presence of human cytomegalovirus (HCMV) antibody in a sample of human blood which comprises substantially uniformly distributing on a surface as target cells a human osteogenic sarcoma cell line designated ATCC Accession Number CRL 8069 and characterized by an unlimited life span, by being chronically and persistently infected with HCMV, and by showing a substantially constant ratio between cells infected with HCMV and non-infected cells, the percentage of infected cells comprising from about 1 to about 10 percent of the total cells, inoculating said target cells with a diluted sample of blood serum to be tested for the presence of HCMV antibody, contacting the cells with a fluorescein isothiocyanate conjugated immunoglobulin, and optically viewing said cells to determine the presence of immunofluorescent positive cells resulting from reaction between cell antigens and test serum antibodies.

4,334,017

METHOD FOR DETECTING CANCER IN MAMMALIAN TISSUE

George M. Plotkin, Lynn, and George Wolf, Lexington, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 30,182, Apr. 16, 1979, abandoned. This application Mar. 16, 1981, Ser. No. 243,860
Int. Cl.[3] G01N *33/54;* C12Q *1/54, 1/48*
U.S. Cl. 435—7 12 Claims

5. An improved noninvasive test for cancer in mammals, comprising:

(a) incubating cells from said mammalian tissue in the presence of a label which: (1) has a specific affinity for β-linked galactose moieties present in the membrane of said cells; and, (2) is capable of being detected after it becomes bound to said β-linked galactose moieties in said cell membrane;

(b) detecting the amount of said label which is bound to said cell membrane; and,

(c) comparing the amount of said label bound to the cell membrane of test cells to the level which would be present in non-cancer cells.

4,334,018

PROCESS AND REAGENT FOR THE DETERMINATION OF PROTHROMBIN

Bruno Kirchhof, Münster, Fed. Rep. of Germany, assignor to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 971,600, Dec. 20, 1978, abandoned. This application Dec. 15, 1980, Ser. No. 216,696
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2757992
Int. Cl.[3] C12Q *1/38, 1/56*
U.S. Cl. 435—13 25 Claims

1. In a process for the determination of prothrombin in biological material, by conversion of prothrombin into thrombin, enzymatic fission of a thrombin substrate and measurement of product, the improvement comprising incubating the test solution with the addition of Factor Xa as the sole enzyme activating prothrombin into thrombin.

8. Reagent for the determination of prothrombin in biological material, comprising a thrombin substrate and a prothrombin activator, wherein the prothrombin activator is Factor Xa in a concentration of from 0.2 to 2.5% of the biological material.

4,334,019

PROCESS FOR PRODUCING DE(MYCINOSYLOXY)TYLOSIN

Richard H. Baltz; Gene M. Wild, Indianapolis, Ind., and Eugene T. Seno, Norwich, England, assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 156,855, Jun. 12, 1980. This application May 8, 1981, Ser. No. 261,826
Int. Cl.[3] C12P *19/62;* C12N *1/20*
U.S. Cl. 435—76 6 Claims

1. The method of producing 23-de(mycinosyloxy)tylosin and 20-dihydro-23-de(mycinosyloxy)tylosin which comprises cultivating *Streptomyces fradiae* NRRL 11271 or a 23-de(mycinosyloxy)tylosin-producing mutant or recombinant thereof in a culture medium containing assimilable sources of carbon, nitrogen, and inorganic salts under submerged aerobic fermentation conditions until a substantial amount of antibiotic activity is produced.

4,334,020

METHOD OF PRODUCING L-GLUTAMIC ACID BY FERMENTATION

Hidetsugu Nakazawa, Kawasaki; Ichiro Yamane, Yamato, and Eiichi Akutsu, Yokohama, all of Japan, assignors to Ajinomoto Company Incorporated, Tokyo, Japan

Filed Jun. 6, 1980, Ser. No. 157,012
Claims priority, application Japan, Jun. 20, 1979, 54/78294
Int. Cl.[3] C12P *13/14*
U.S. Cl. 435—110 3 Claims

1. A method for producing L-glutamic acid by fermentation which comprises aerobically culturing in an aqueous culture medium a mutant of the genus Brevibacterium or Corynebacterium resistant to a compound having vitamine-P activity, selected from the group consisting of acenocoumarin, apiin, coumetarol, cyclocumarol, dicumarol, diosmetin, esculetin, esculin, ethyl-bis-coumacetate, 3,3'-ethylidene-bis-4-hydroxycoumarin, hesperetin, hesperidin, morin, naringenin, phenprocoumon, quercetin, quercimeritrin, robinin, rutin, scopa-

rone, skimmin, umbelliferone, and warfarin, and recovering the L-glutamic acid accumulated in the resulted culture liquid.

4,334,021

PROCESS FOR PRODUCING COPROPORPHYRIN III

Ichiro Kojima, Yokosuka; Kenji Maruhashi, Yokohama, and Yasuo Fujiwara, Tokyo, all of Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Filed Nov. 28, 1980, Ser. No. 211,057
Claims priority, application Japan, Nov. 29, 1979, 54/153648
Int. Cl.³ C12P *17/16*
U.S. Cl. 435—118 6 Claims

1. In a process for producing coproporphyrin III which comprises cultivating a coproporphyrin III-producing microorganism of the genus Arthrobacter in a culture medium containing a carbon source, a nitrogen source and a mineral and recovering coproporphyrin III from the culture broth, the improvement wherein the culture medium contains at least 0.1 g, per liter of the culture medium, of L-cystine, at least 0.5 g, per liter of the culture medium, of Mg^{++}, or both.

4,334,022

METHOD FOR PRODUCING MILDIOMYCIN

Takashi Suzuki, Suita; Hidekazu Sawada, Neyagawa, and Tsunetomo Asai, Kawanishi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jun. 16, 1980, Ser. No. 159,925
Claims priority, application Japan, Jun. 21, 1979, 54-78917
Int. Cl.³ C12N *1/38*
U.S. Cl. 435—119 10 Claims

1. In a method for producing mildiomycin which comprises cultivating a mildiomycin-producing microorganism belonging to the genus Streptoverticillium in a culture medium to elaborate and accumulate mildiomycin in the culture broth, the improvement wherein the cultivation is carried out in the presence of an N-methyl compound and wherein the concentration of N-methyl compound in the culture medium is at least 3 mM.

4,334,023

PROCESS FOR OBTAINING CHOLESTEROL OXIDASE

Helmgard Gauhl, Tutzing; Georg Schawohl, Munich; Hans Seidel, and Klaus Beaucamp, both of Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed May 7, 1980, Ser. No. 147,460
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1979, 2924875
Int. Cl.³ C12N *9/04*
U.S. Cl. 435—190 8 Claims

1. Process for the preparation of cholesterol oxidase, which comprises culturing at least one micro-organism from the group consisting of

Streptomyces griseofuscus DSM 40191,
Streptomyces hygroscopicus 40771,
Streptomyces acidomyceticus DSM 40798; and
Arthrobacter paraffinens DSM 312,

and recovering cholesterol oxidase from the culture.

4,334,024

PREPARATION AND CRYSTALLIZATION OF FRACTION I PROTEIN FROM PLANT SOURCES

Sarjit Johal, 1411 S. 11th St. #2, Lincoln, Nebr. 86502

Filed Nov. 3, 1980, Ser. No. 203,779
Int. Cl.³ C12N *9/88*
U.S. Cl. 435—232 16 Claims

1. A method for preparing crystalline ribulose 1,5-bisphosphate carboxylase from plant material comprising the steps of:

(a) grinding a sample of said plant material with a suitable buffer solution;
(b) filtering said solution;
(c) adding to said solution, while stirring, sufficient quantities of polyethylene glycol (PEG) having a molecular weight in the range from 5000 to 7000 to bring said polyethylene glycol to a final concentration in the range from 5 to 15 (weight/volume) percent;
(d) discarding the precipitates formed;
(e) storing said solution for about 1 to 8 hours;
(f) collecting and washing the crystals resulting from said storage; and
(g) lyophilizing said crystals.

4,334,025

NOVEL SUBSTANCE M-9337 AND PROCESS FOR PREPARING SAME

Sadao Miyamura, Niigata, Japan, assignor to SS Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Jan. 30, 1981, Ser. No. 230,293
Claims priority, application Japan, Jan. 31, 1980, 55-10481
Int. Cl.³ C12N *1/20;* C12P *7/00;* A61K *35/74*
U.S. Cl. 435—253 4 Claims

1. A substance M-9337 having the following properties:

(1) Nature: Neutral (1 mg/ml: pH 6–7), white to light yellow powder;
(2) Elementary analysis:
C . . . 52–53%
H . . . 7–8%
O . . . 39–41%;
(3) Solubility: Soluble in dimethylsulfoxide and a mixed solvent of chloroform and methanol, slightly soluble in water and methanol, and insoluble in ethyl acetate and chloroform;
(4) Color reaction:Positive with respect to anthrone, iodine, ammonium molybdate-perchloric acid, and anisaldehyde reactions and negative with respect to ninhydrin and Dragendorff reagent reactions;
(5) Melting point: 170°–175° C. (decomposed);
(6) Ultraviolet absorption spectrum: As seen in FIG. 1;
(7) Infrared absorption spectrum (KBr): As seen in FIG. 2; and
(8) Thin layer chromatography:
n-propanol-water (4:1)
Rf=about 0.5
n-butanol-acetic acid-water (4:1:5)
Rf=about 0.28
toluene-formic acid-ethyl formate (5:1:4)
Rf=about 0.013
n-butanol-pyridine-water (3:2:1)
Rf=about 0.51
n-propanol-N ammonia-water (6:2:1)
Rf=about 0.41.

4,334,026

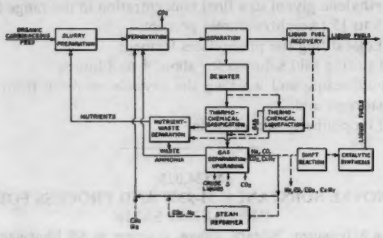
HYBRID BIO-THERMAL LIQUEFACTION

David P. Chynoweth, St. Charles, and Paul B. Tarman, Elmhurst, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Continuation-in-part of Ser. No. 113,242, Jan. 18, 1980, Pat. No. 4,289,625. This application Sep. 11, 1980, Ser. No. 186,248
Int. Cl.³ C12P *7/08*
U.S. Cl. 435—163 33 Claims

1. A hybrid bio-thermal liquefaction process for improved carbonaceous liquefaction to produce alcohol containing liquid fuels comprising: adding organic carbonaceous feed to a fermentation reactor; fermenting said organic carbonaceous feed under alcohol producing conditions in an active alcohol producing biological liquid culture; separating alcohol containing liquid fuel product and fermentation residue and dewatering and introducing said fermentation residue into a thermochemical converter; thermochemically converting at least a substantial portion of the organic carbon component of said fermentation residue under elevated temperature conditions

producing thermochemical converter products and thermochemical residue, a portion of at least one of said thermochemi-



cal products or their derivatives or thermochemical residue being passed to said fermentation reactor.

4,334,027

PREPARATION OF IMMOBILIZED ENZYMATICALLY-ACTIVE SUBSTANCE

Joachim Klein, Schapenbruch 14, 3300 Braunschweig, and Fritz Wagner, Hohe Wiese 2, 3300 Braunschweig-Stöckheim, both of Fed. Rep. of Germany

Filed Feb. 25, 1980, Ser. No. 124,573
Int. Cl.³ C12N *11/10, 11/08, 11/04*
U.S. Cl. 435—178 **26 Claims**

1. In a process for producing an immobilized enzymatically-active substance in which an enzymatically-active substance in combination with an aqueous polyelectrolyte solution comprising a substantial amount of alginate is added to an aqueous precipitation bath containing a source of multivalent ion having a charge opposite to that of the polyelectrolyte so that said polyelectrolyte precipitates to form beads of gel containing said enzymatically-active substance wherein the improvement comprises:

(a) drying of the precipitated beads of gel under controlled conditions as to significantly reduce the diameter of the beads, thereby hardening said beads and imparting to said beads significantly increased strength and a higher ratio of the content of enzymatically-active substance to the diameter of the beads; and

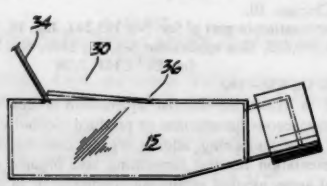
(b) adding the beads resulting from step (a) to a precipitation bath containing a multivalent ion having a charge opposite to that of the polyelectrolyte to effect further hardening of the beads.

4,334,028

FLASK

Joseph L. Carver, 310 Via Lido Nord, Newport Beach, Calif. 92663

Filed Jan. 2, 1981, Ser. No. 222,045
Int. Cl.³ C12M *3/00*
U.S. Cl. 435—284 **4 Claims**



1. In a flask suitable for tissue or micro-organism culture, having top and bottom walls, a pair of similar side walls, a closed end wall, a second end wall having an opening therein, a tubular open neck in sealing engagement at one end with the second end wall so as to surround the opening therein, and means for sealing the other end of the neck, the improvement which comprises a frangible zone integrally formed in the top wall for access to the interior of the culture flask.

4,334,029

UNFIRED REFRACTORY COMPOSITION

Hiroyuki Naito; Takashi Maruya, both of Tsuruoka; Kyugo Gotoh, Urawa, and Hideyo Ohmori, Funabashi, all of Japan, assignors to Mizusawa Kazahu Kogyo Kabushiki Kaisha, Osaka; Mitsubisha Corporation, Tokyo and Yamato Refractives & Co., Chiba, all of, Japan

Filed Jan. 6, 1980, Ser. No. 222,929
Claims priority, application Japan, Jan. 9, 1980, 55-579
Int. Cl.³ C04B *35/52*
U.S. Cl. 501—109 **7 Claims**

1. An unfired refractory composition comprising a refractory aggregate and a binder for the refractory aggregate, in which the binder comprises a water-soluble or water-dispersible siliceous binder in an amount of 1 to 20% by weight based on the refractory aggregate, a carbonizable organic binder in an amount of 2 to 15% by weight based on the refractory aggregate and a phosphate type hardening agent in an amount of 0.5 to 20% by weight based on the refractory aggregate wherein the siliceous binder is an alkali metal borosilicate binder in which the M_2O/SiO_2 molar ratio (in which M stands for an alkali metal) is in the range of from 0.4 to 1.20 and the B_2O_3/SiO_2 molar ratio is in the range of from 0.01 to 0.3

4,334,030

THERMOPLASTIC FOAMABLE BLENDS

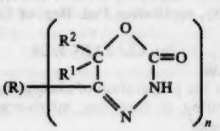
John E. Kochanowski, Monterey, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Nov. 23, 1979, Ser. No. 97,017
Int. Cl.³ C08J *9/08, 9/10*
U.S. Cl. 521—90 **17 Claims**

1. A substantially uniform injection moldable foamable blend comprising:

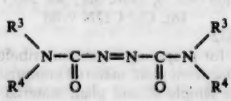
(i) a thermoplastic organic polymer;

(ii) a dihydrooxadiazinone represented by the formula



wherein n is an integer equal to 1 or 2; R is a monovalent radical when n is 1, and a divalent radical when n is 2, selected from a $C_{(1-8)}$ alkyl radical or alkylene radical, a $C_{(6-30)}$ aryl radical or arylene radical and halogenated derivatives thereof; R^1 and R^2 are independently selected from hydrogen, $C_{(1-8)}$ alkyl, alkylene, $C_{(6-30)}$ aryl, alkoxy and aryloxy radicals; and,

(iii) amide derivatives of azodicarboxylic acid represented by the general formula



wherein R^3 and R^4 are independently selected from hydrogen and $C_{(1-10)}$ alkyl radicals.

4,334,031

FLAME-RETARDANT POLYURETHANE FOAM PREPARED BY INCORPORATING A GRAFT POLYMER HAVING A PARTICLE SIZE GREATER THAN 0.5 MICRON

Jay G. Otten, Flat Rock; Duane A. Heyman, Monroe, both of Mich., and John R. Murphy, Wayne, Pa., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 12, 1981, Ser. No. 224,352

Int. Cl.³ C08G *18/14*

U.S. Cl. 521—106 **6 Claims**

1. In the preparation of a flame-retardant, flexible polyurethane foam prepared from the reaction of a polyoxyalkylene polyether polyol having an average equivalent weight of from 200 to 2500 and graft polymer content of at least 5 parts by weight per 100 parts by weight of said polyol, an organic polyisocyanate, a blowing agent and flame-retardant compounds, the improvement comprises incorporating therein a graft polymer having a particle size greater than 0.5 micron.

4,334,032

FOAMED POLYMERS CONTAINING LOW MOLECULAR WEIGHT URETHANE MODIFIER COMPOUND

John T. Patton, Jr., Wyandotte, Mich., and Herwart C. Vogt, Sparta, N.J., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation of Ser. No. 77,845, Sep. 21, 1979, abandoned. This application Mar. 13, 1981, Ser. No. 243,536

Int. Cl.³ C08G *18/14, 18/71, 18/16*

U.S. Cl. 521—115 **4 Claims**

1. In a polyurethane foam prepared by the reaction of a polyoxyalkylene polyether polyol with an organic polyisocyanate in the absence of a trimerization catalyst, the improvement which comprises incorporating in the preparation of said foam from about 2 percent by weight to 75 percent by weight based upon the total weight of the polyether polyol and the organic polyisocyanate an isocyanate-free, hydroxyl group-free reaction product of an organic isocyanate with a monohydric or polyhydric compound containing from 1 to 4 hydroxyl groups and from 2 to 18 carbon atoms.

4,334,033

PROCESS FOR THE MANUFACTURE OF POLYURETHANE ELASTOMERS

Lothar Metzinger; Otmar Zipp, both of Osnabrueck, and Heinz Bollmann, Alfhausen-Heeke, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 6, 1980, Ser. No. 194,530

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1979, 2940856

Int. Cl.³ C08G *18/14*

U.S. Cl. 521—159 **17 Claims**

1. A process for the manufacture of polyurethane elastomers comprising the steps of:

(a) preparing a hydroxyl group-containing prepolymer by reacting a higher molecular weight polyhydroxyl compound with an organic diisocyanate at a weight ratio of OH groups to NCO groups of about 1.2:1 to 2:1,

(b) dividing said prepolymer into two components A and B in a weight ratio of about 80:20 to 20:80,

(c) reacting component A with 1,5-naphthylene diisocyanate (NDI) in a weight ratio of OH:NCO groups of about 1:2.5 to 1:12 to produce a terminal NCO group-containing NDI-polyurethane adduct,

(d) mixing component B with material selected from the group consisting of chain extenders, crosslinking agents, water and mixtures thereof and optionally auxiliaries and additives, and

(e) reacting said NDI polyurethane adduct (from step c) with the mixture from step d.

4,334,034

PROCESS FOR THE PREPARATION OF POLYMERIZABLE POLYURETHANE ELASTOMERS

August Lehner, Roedersheim-Gronau; Heinrich Hartmann, Limbergerhof; Guenter Heil, Ludwigshafen; Werner Lenz, Bad Durkheim; Ingolf Buethe, Mannheim, and Rudolf Bachmann, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 5, 1981, Ser. No. 231,836

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1980, 3005035

Int. Cl.³ C08G *63/76, 18/62*

U.S. Cl. 525—28 **7 Claims**

1. A process for the preparation of polymerizable, primarily linear thermoplastic polyurethane elastomers with acrylate side groups comprising reacting an organic polyisocyanate with a mixture of

(a) an acrylate diol having a molecular weight of 146 to 3000,

(b) an organic polyhydroxyl compound other than those of paragraph (a) having a molecular weight between 400 and 5000, and

(c) a chain extender selected from the group consisting of diols, diamines, aminoalcohols, and triols, having a molecular weight between 61 and 400, water, and mixtures thereof

wherein the ratio of isocyanate to active hydrogen containing groups is from 0.8:1 to 1.2:1 and wherein 1.4 to 1.8 moles of organic polyisocyanate, 0 to 15 moles of component (c) and 0.3 to 6 moles of component (a) are used per mole of component (b).

4,334,035

UNSATURATED POLYESTER RESIN COMPOSITION

Taketoshi Fujita; Yasuyuki Ohgi, and Yousui Nemoto, all of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1981, Ser. No. 245,436

Int. Cl.³ C08G *63/54*

U.S. Cl. 525—34 **3 Claims**

1. An unsaturated polyester resin composition comprising (A) an unsaturated polyester alkyd prepared by condensing all or at least 30 mol% of 1,2-butanediol as a polyhydric alcohol component, all or part of phthalic anhydride as a saturated polybasic acid component, and an unsaturated polybasic acid component, and (B) an unsaturated monomer copolymerizable with said component (A), the amount of said component (B) being 20 to 55 parts by weight based on 100 parts by weight of said component (A).

4,334,036

PROCESS FOR PRODUCING CURABLE VINYL POLYMER HAVING SILYL GROUP

Kazuya Yonezawa; Hisao Furukawa, and Masaaki Azuma, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 936,628, Aug. 24, 1978, abandoned. This application Jul. 11, 1980, Ser. No. 167,657

Int. Cl.³ C08F *8/34, 8/42, 236/02*

U.S. Cl. 525—102 **5 Claims**

1. A process for producing vinyl polymer having a silyl group for use as a coating material, which comprises reacting at 50° to 150° C. for a period of from 1 to 4 hours, and in the presence of a catalyst selected from a member of the group VIII transition metals or complexes thereof, a hydrosilane compound represented by the formula:

$$X_{3-a}\overset{(R_1)_a}{\underset{|}{Si}}-H$$

wherein R_1 is a hydrogen or a monovalent hydrocarbon radical having 1 to 10 carbon atoms, X is a member selected from the group consisting of halogen, alkoxy radical, acyloxy radical, aminoxyl radical, phenoxy radical, thioalkoxy radical and amino radical and "a" is a whole number equal to 0, 1 or 2;

with a polymer or copolymer comprising 1 to 95 weight percent monomer or monomers (A) selected from the group consisting of methyl methacrylate, butyl acrylate, butyl methacrylate, styrene, acrylic acid, maleic acid anhydride, 2-ethyl-hexyl acrylate and mixtures thereof; and 99 to 5 weight percent of a monomer or monomers (B) selected from the group consisting of allyl methacrylate, allyl acrylate, and mixtures thereof; and

wherein the main chain is a vinyl polymer having a molecular weight of between 200 to 30,000; and

wherein said resulting vinyl polymer having a silyl group is substantially free of internal double bonds.

4,334,037

MOULDING COMPOSITIONS OF A STYRENE POLYMER AND PTFE PARTICLES

Eric H. W. Allen, Luton, England, assignor to George Kent Limited, Luton, England

Continuation of Ser. No. 49,749, Jun. 18, 1979, abandoned. This application May 7, 1981, Ser. No. 261,515

Claims priority, application United Kingdom, Mar. 7, 1979, 7908122

Int. Cl.³ C08L *25/06, 27/18*

U.S. Cl. 525—199 **12 Claims**

1. A thermoplastic moulding composition comprising a major proportion of a thermoplastic styrene-based polymeric material having dispersed therein at least 5% by weight, based on the total weight of the composition of PTFE particles, said PTFE particles being of a generally granular nature having an average particle size in the range of 1 to 10 μm with not more than 1% of the PTFE particles having sizes greater than 50 μm and wherein the maximum transverse dimension of the PTFE particles does not differ significantly from their minimum dimension, such that the melt elasticity of the composition during moulding does not differ significantly from that of the polymeric material without said PTFE particles.

4,334,038

SHAPING OF PLASTIC MATERIALS CONTAINING POLYMERIC LUBRICANT

Heinz Beck, Duren; Karl H. Frassek, Langerwehe, both of Fed. Rep. of Germany; Egenius A. Giezen, BA Rheden, and Eduard M. Verhulst, BA Zevenaar, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Jan. 30, 1981, Ser. No. 229,916

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1980, 3003797

Int. Cl.³ C08L *23/08, 35/00, 35/02*

U.S. Cl. 525—207 **11 Claims**

1. A process for shaping plastic materials, wherein a molded body is produced from a melt of a mixture comprising a plastic material, stabilizers and/or antioxidants, pigments and/or fillers, flowing agents and a lubricant, wherein the lubricants comprise a copolymer of unsaturated polycarboxylic acids, or anhydrides thereof, and α-olefins having an average carbon number of at least 28 carbon atoms.

4,334,039

PROCESS FOR PREPARING POLYMERIC POLYBLENDS HAVING A RUBBER PHASE AS PARTICLES WITH A BIMODAL PARTICLE SIZE DISTRIBUTION

Carl R. Dupre, Amherst, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 23, 1981, Ser. No. 246,486

Int. Cl.³ C08F *259/02, 279/02*

U.S. Cl. 525—263 **18 Claims**

1. A continuous mass polymerization for preparing monoalkenyl aromatic polyblends having a dispersed rubber phase as rubber particles having a bimodal rubber particle size distribution comprising,

A. continuously mass polymerizing a first solution of an alkenyl aromatic monomer having dissolved therein about 2 to 15% by weight of a first diene rubber in a first reaction zone to a conversion of about 10 to 40% forming a partially polymerized first solution with said first diene rubber being dispersed as rubber particles having an average diameter of about 0.1 to 1.0 microns,

B. continuously feeding said partially polymerized first solution to a second reaction zone in series with said first reaction zone, simultaneously with a second solution of a monoalkenyl aromatic monomer having dissolved therein about 2 to 15% by weight of a second diene rubber, forming a partially polymerized second solution,

C. continuously mass polymerizing said partially polymerized second solution in said second reaction zone to a conversion of about 20 to 50% forming a partially polymerized third solution having the second diene rubber dispersed as rubber particles having an average diameter of about 2 to 5 microns,

D. continuously mass polymerizing said third solution in a third reaction zone to a conversion of about 60 to 95%,

E. continuously removing an effluent from said third reaction zone and separating said polyblend from said effluent, said polyblend having a polyalkenyl aromatic polymer as a matrix polymer with said first diene rubber dispersed as rubber particles having a average diameter of about 0.1 to 1.0 microns and said second diene rubber dispersed as rubber particles having an average diameter of about 2 to 5 microns providing said polyblend with a rubber phase having said bimodal particle size distribution, wherein about 70–95% of the rubber particles have a particle size of about 0.5 to 1.0 microns and 5 to 30% of the rubber particles have a particle size of about 2.0 to 5.0 microns, said polyblend having superior toughness and gloss.

4,334,040

PROPYLENE BLOCK COPOLYMERS

Masaki Fujii, and Mitsutaka Miyabayashi, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Japan

Filed Sep. 12, 1980, Ser. No. 186,578

Claims priority, application Japan, Sep. 18, 1979, 54-119943; Sep. 18, 1979, 54-119944

Int. Cl.³ C08F *255/08*

U.S. Cl. 525—321 **12 Claims**

1. A thermoplastic propylene block copolymer, characterized in that:

(1) the limiting viscosity of said copolymer in decalin at 135° C. is 0.3 to 15 dl/gram;

(2) said copolymer comprises 2 to 40 percent by weight of hexene-1 and 1 to 50 percent by weight of ethylene, the remainder being substantially propylene, in blocks consisting essentially of (a) a random copolymer block of propylene and hexene-1 and (b) an ethylene polymer block selected from the group consisting of ethylene homopolymer blocks, binary random copolymer blocks of ethylene and hexene-1 and ternary random copolymer blocks of ethylene, propylene and hexene-1; and

(3) the quantity, the fusion peak temperature as determined by differential scanning calorimetry (DSC), and the contents of hexene-1 and ethylene of each of the fractions resulting from successive extraction of the copolymer at 40° C. and 80° C. by means of o-dichlorobenzene are as indicated in the table:

Fraction	Quantity (% by weight)	Fusion peak temp. by DSC (°C.)	Content of [straight-chain α-olefin] hexene-1 (% by weight)	Content of ethylene (% by weight)
Fraction soluble at 40° C. or lower	5 to 40	Substantially no peaks recognizable	5 to 80	4 to 50
Fraction soluble above 40° C. up to 80° C.	15 to 45	80 to 150 at the higher temp. 135 to 165 at the lower temp. 105 to 135	3 to 60	3 to 45
Fraction insoluble at 80° C. or lower	15 to 80		0.1 to 11	1 to 35

4,334,041
TWO-PHASE ETHYLENE-PROPYLENE BLOCK COPOLYMERIZATION PROCESS

Edward A. Zukowski, Clark, N.J., assignor to El Paso Polyolefins Company, Paramus, N.J.

Continuation-in-part of Ser. No. 177,296, Aug. 11, 1980, Pat. No. 4,284,738. This application Jul. 16, 1981, Ser. No. 283,777

Int. Cl.³ C08F *297/08*

U.S. Cl. 525—53 **14 Claims**

1. A continuous sequential vapor phase block copolymerization process for the production of impact resistant ethylene-propylene polymers at high productivity rates, which comprises:

(A) preparing a propylene prepolymer in finely divided form and containing active catalyst residues by polymerizing propylene at a pressure sufficient to maintain propylene in liquid phase and at a temperature ranging between about 145° F. and about 160° F. in the presence of a catalyst composition containing the components:

(a) a first at least partial complex of an alkyl aluminum compound with an electron donor compound wherein the alkyl aluminum is selected from aluminum trialkyl or a mixture of aluminum trialkyl and a dialkyl aluminum halide and wherein the mole ratio of alkyl aluminum to electron donor is maintained between about 2 and about 5, and,

(b) a complex of an electron donor compound with a titanium tri- or tetrahalide supported on magnesium dihalide, where the components (a) and (b) are being provided in a molar ratio of Al/Ti between about 40:1 and about 150:1, and,

separating the propylene prepolymer from volatile constituents;

(B) introducing the propylene prepolymer, ethylene and propylene into at least one continuously agitated vapor phase reaction zone;

(C) introducing to said vapor phase reaction zone:

(i) a quantity of a second at least partial complex of an alkyl aluminum compound with an electron donor compound, wherein the alkyl aluminum is selected from trialkyl aluminum or mixtures of trialkyl aluminum and dialkyl aluminum halide and wherein the mole ratio of alkyl aluminum to electron donor compound is maintained in a range from about 8:1 to about 15:1 and the quantity of aluminum alkyl compound is between about 15 to about 50% of the aluminum alkyl compound of component (a), and,

(ii) an additional quantity of component (b) sufficient to provide a molar ratio of Al/Ti of components (i) and (ii) between about 75:1 and about 125:1,

(D) polymerizing said ethylene and propylene onto the propylene prepolymer in said vapor phase reaction zone at the temperature of from about 140° F. to about 170° F.

4,334,042
CARBONYLATION OF OLEFINIC COMPOUNDS

Mitsuo Matsumoto, and Masuhiko Tamura, both of Kurashiki, Japan, assignors to Kuraray Co. Ltd., Kurashiki, Japan

Filed Jul. 23, 1979, Ser. No. 59,518

Claims priority, application Japan, Aug. 7, 1978, 53-96387

The portion of the term of this patent subsequent to Dec. 9, 1997, has been disclaimed.

Int. Cl.³ C07C *45/50, 67/38;* C08F *8/14, 8/00*

U.S. Cl. 525—339 **8 Claims**

1. A process for carbonylating olefinic compounds which comprises bringing an olefinic compound into contact with carbon monoxide and hydrogen or an alcohol in the presence of a cobalt carbonyl catalyst plus a secondary phosphine oxide having the general formula (I)

(I)

wherein R^1 and R^2 are the same or different and each is a substituted or unsubstituted hydrocarbon residue containing not more than about 20 carbon atoms, said secondary phosphine oxide being added to the reaction system in an amount of 0.2 to 20 moles per gram atom of the cobalt.

4,334,043
METALLIC SALT PRE-TREATMENT OF CROSSLINKABLE CO-POLYMERS FOR ELIMINATING TACKINESS

Jürgen Groepper, Günzburg, Fed. Rep. of Germany, assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 7, 1980, Ser. No. 176,170

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936906

Int. Cl.³ C08F *8/42, 8/44, 8/46*

U.S. Cl. 525—370 **7 Claims**

1. In a process for the crosslinking of crosslinkable polymers or co-polymers comprising molding the crosslinkable polymers or co-polymers into the desired shaped articles and crosslinking the shaped articles with free radical initiators of organic peroxides in the presence of oxygen wherein the crosslinked polymer or copolymer products have a tacky surface, the improvement comprising pretreating the shaped articles of crosslinkable polymers or copolymers prior to crosslinking by heating to prevent the surface of the shaped articles from being tacky with a member coated thereon selected from the group consisting of

(a) an organo-metallic compound prepared by reacting an aliphatic or aromatic acid with a transition element,

(b) inorganic acid salts of transition elements,

(c) lanthanide compound, and

(d) mixtures thereof wherein the transition elements are metals selected from the Periodic Table having an atomic number in the range of 21 to 30, 39 to 48, 57 to 80 and 89 to 92.

4,334,044

DIENE RUBBER HAVING ANTI-DETERIORATING FUNCTION AND PROCESS FOR PRODUCTION THEREOF

Teizo Kotani, Yokohama; Yasuhiko Takemura, and Toshio Miyabayashi, both of Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed May 7, 1980, Ser. No. 147,529
Claims priority, application Japan, May 18, 1979, 54/60526
Int. Cl.[3] C08F 8/32
U.S. Cl. 525—379 22 Claims

1. A diene rubber having resistance to deterioration and an anti-deteriorating function obtained by reacting a polymer, of a conjugated diene monomer having nitrile groups with an anti-deteriorating agent having at least one polar group selected from the group consisting of amino group and imino group in the presence of an acid catalyst.

4,334,045

LOW COLOR COMPOSITIONS COMPRISING A CROSS-LINKED POLYCYANURATE POLYMER AND A THERMOPLASTIC POLYMER

Tse C. Wu; Dusan C. Prevorsek, and David H. Wertz, all of Morristown, N.J., assignors to Allied Corporation, Morristown, N.J.

Filed Dec. 5, 1980, Ser. No. 213,530
Int. Cl.[3] C08L 69/00, 67/02
U.S. Cl. 525—439 28 Claims

1. A process for preparing a cured composition which comprises:

(a) purifying a monomeric aromatic dicyanate to remove color forming impurities;

(b) combining the purified aromatic dicyanate with an effective amount of a zinc salt and with a thermoplastic polymer;

(c) curing the aromatic dicyanate at at least one temperature at least about 150° C. and below about 200° C.; and

(d) further curing the aromatic dicyanate at at least one temperature between about 200° C. and about 300° C., for a time sufficient to cure the dicyanate without causing such color formation that the Yellowness Index of the cured composition exceeds about 30.

4,334,046

PRODUCTION OF COPOLYMERS OF ACRYLONITRILE AND VINYL CHLORIDE

Joachim König, Berg.-Gladbach, and Carlhans Süling, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 868,728, Jan. 11, 1978, abandoned. This application Nov. 19, 1979, Ser. No. 95,724
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1977, 2702053
Int. Cl.[3] C08F 2/30, 222/30, 2/26
U.S. Cl. 526—93 7 Claims

1. In a semi-continuous or continuous process for the production of a chemically uniform acrylonitrile-vinyl chloride copolymer which contains from 30 to 60% by weight of acrylonitrile, from 70 to 40% by weight of vinyl chloride and, from 0 to 15% by weight of at least one other vinyl monomer, which process comprises polymerisation in aqueous emulsion in the presence of an nonionic or anionic emulsifier or mixture thereof in the presence of a redox catalyst of a peroxodisulphate and a water-soluble compound of tetravalent sulphur at a constant polymerisation velocity and with a fluctuating concentration of at least one iron salt in the reaction medium, the improvement wherein the polymerisation reaction is carried out at a pH-value of from 2 to 6 in the presence of a mixture of an iron salt and citric acid as a complex former.

4,334,047

POLYMERIZATION CATALYSTS

John B. Rogan, Glen Ellyn, and Robert V. Morris, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 700,582, Jun. 28, 1976, abandoned. This application Dec. 2, 1977, Ser. No. 856,763
Int. Cl.[3] C08F 4/64, 10/06
U.S. Cl. 526—138 20 Claims

1. An alpha-olefin polymerization catalyst composition comprising:

(a) an alkylaluminum component selected from the group consisting of a trialkylaluminum, a dialkylaluminum chloride or bromide, a mixture of a trialkylaluminum and a dialkylaluminum chloride or bromide, and a mixture of a trialkylaluminum and an alkylaluminum dichloride or dibromide; wherein each alkyl radical contains from 1 to about 6 carbon atoms;

(b) a titanium trichloride;

(c) an effective amount, up to about 20 mol % based upon the amount of the titanium trichloride employed, of sulfur dioxide; and

(d) an effective amount, ranging from about 0.2 to 10 mols per mol of sulfur dioxide employed, of 2,4,6-collidine;

said effective amounts being effective to reduce the fraction of alkane-soluble polymer produced during polymerization of said alpha-olefin without serious decreases in total polymer yield.

4,334,048

OLEFIN METATHESIS

Thomas J. Katz, New York; Mridula Nair, Penfield, and Steven J. Lee, New York, all of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 26, 1981, Ser. No. 267,111
Int. Cl.[3] C08F 4/78
U.S. Cl. 526—170 5 Claims

1. A process for polymerizing a cyclic or acyclic olefin to obtain a highly chemically homogeneous (stereoselective) polymer employing acetylene or substituted acetylene as a coinitiator which comprises the steps of:

reacting said olefin with phenylacetylene, both having been passed through short columns of alumina to obtain a mixture;

distilling said mixture into an ampule containing (phenylmethoxycarbene) pentacarbonyl tungsten and sealing the ampule;

heating the contents of said sealed ampule; and

dissolving the contents of said sealed ampule in methylene chloride, and precipitating said highly chemically homogeneous polymer therefrom using methanol.

4,334,049

PROCESS FOR THE PREPARATION OF FINELY DIVIDED SOLID POLYMERS IN POLYOL

Gerhard G. Ramlow, Grosse Ile; Duane A. Heyman, Monroe, and Richard A. Moore, Trenton, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Aug. 18, 1980, Ser. No. 179,136
Int. Cl.[3] C08F 2/00
U.S. Cl. 526—202 11 Claims

1. In a process for the preparation of a finely divided solid polymer prepared by polymerizing in the presence of a free-radical initiator, and an organic solvent, an ethylenically unsaturated monomer or mixture of monomers, the improvement comprises, conducting said polymerization in the presence of an effective amount of a preformed polymeric stabilizer wherein said stabilizer consists of an alkylene oxide adduct of a copolymer of styrene-allyl alcohol, said stabilizer having an equivalent weight of 220 to 8000.

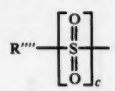
4,334,050

ARENE POLYSULFONYL HALIDE COUPLED BLOCK POLYMERS OF POLYPHENYLENE OXIDE AND AROMATIC POLYFORMALS

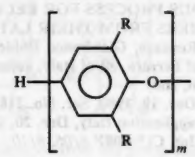
Dwain M. White, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 9, 1981, Ser. No. 232,776
Int. Cl.[3] C08G *81/00, 65/38*
U.S. Cl. 525—390 5 Claims

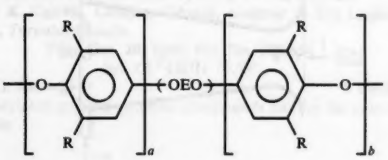
2. An arene polysulfonyl halide coupled polyphenylene oxide aromatic polyformal block copolymer comprising an arene sulfonyl radical of the formula:



wherein c is a number at least equal to 2, and R'''' is selected from phenylene, biphenylene, bis(phenylene)-C_{1-8} alkane, biphenylene oxide, and poly(C_{2-8} oxyalkylene); a polyphenylene oxide radical of the formulas:



wherein independently each R is hydrogen, a hydrocarbon radical, a halohydrocarbon radical, a hydroxcarbonoxy radical or a halohydrocarbonoxy radical, m is a number of at least 1, or



wherein independent each —(OEO)— is a divalent quinone residue, E is a divalent arene radical, either a or b is at least equal to 1, the sum of a plus b is at least equal to 10, R is the same as above, and an aromatic polyformal radical of the formula:

$$-(OR'OCH_2)_n-OR'O-$$

wherein n is an integer at least equal to 1, and R' is a divalent aromatic radical.

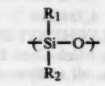
4,334,051

HEAT RESISTANT POLYVANADIOSILOXANES AND A PROCESS FOR THEIR PRODUCTION

Seishi Yajima, Tohoku daigaku shukusha 4-2, 843, Ohnuki-machi, Oharai-machi, Higashubaraki-gun, Ibaraki-ken, Japan; Kiyohito Okamura, and Toetsu Shishido, both of Oharai, Japan, assignors to Seishi Yajima, Japan

Filed Nov. 26, 1980, Ser. No. 210,639
Claims priority, application Japan, Dec. 5, 1979, 54-156886; Mar. 31, 1980, 55-040304
Int. Cl.[3] C08G *77/04*
U.S. Cl. 528—25 8 Claims

4. A process for the production of a polyvanadiosiloxane which comprises reacting an oily polysiloxane having the main chain skeleton consisting of units of



wherein R_1 and R_2 may be the same or different and stand for a lower alkyl group, phenyl group, fluoroalkyl group, nitrile group or vinyl group, and a vanadium compound by heating at a temperature of 450° C. or less under conditions capable of forming a complex of the vanadium compound.

4,334,052

RIGID, NON-CELLULAR POLYURETHANE MODIFIED WITH REACTION PRODUCT OF AN ISOCYANATE AND AN ALCOHOL

John T. Patton, Jr., Wyandotte, Mich.; Herwart C. Vogt, Sparta, N.J., and Manher Parekh, Warren, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation of Ser. No. 77,846, Sep. 21, 1979, abandoned. This application Mar. 13, 1981, Ser. No. 243,537
Int. Cl.[3] C08G *18/38, 18/16, 18/71*
U.S. Cl. 528—52 4 Claims

1. In the process for the preparation of a noncellular, solid urethane polymer composition prepared by the reaction of a polyoxyalkylene polyether polyol with an organic polyisocyanate in the absence of a trimization catalyst, the improvement comprising the addition of from about 2 percent by weight to 75 percent by weight based upon the total weight of the polyether polyol and the organic polyisocyanate, an isocyanate-free, hydroxyl group-free reaction product of an organic isocyanate with a monohydric or polyhydric compound containing from 1 to 4 hydroxyl groups and from 2 to 18 carbon atoms prior to said reaction.

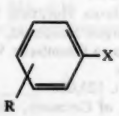
4,334,053

PROCESS FOR THE PREPARATION OF AROMATIC POLYESTERS AND THE USE THEREOF FOR THE PRODUCTION OF INJECTION MOLDED ARTICLES, FILMS AND COATINGS

Dieter Freitag, Krefeld; Klaus Reinking, Wermelskirchen; Karsten Idel, Krefeld; Harald Medem, Krefeld, and Ludwig Bottenbruch, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 29, 1980, Ser. No. 191,670
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1979, 2940024
Int. Cl.[3] C08F *4/46*
U.S. Cl. 528—179 9 Claims

1. Thermoplastic aromatic polyesters based on diphenols, terephthalic and isophthalic acid (acid ratio of from 7:3 to 3:7), chain terminators and optionally branching agents, characterised in that the chain terminators are compounds of the formula (I)



(I)

wherein

X represents OH, OCOCl or COCl and

R represents a branched chain alkyl radical having 8 or 9 carbon atoms, provided that in the alkyl radical R 47 to 89% of the hydrogen atoms are part of methyl groups,

that R is in the o- and/or p-position and the upper limit of the amount of the o-isomer is 20%.

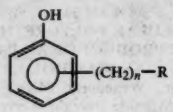
4,334,054

FILMS OF POLYPHENYLENE OXIDES

Jacques E. Dubois, Paris; Minh-Chau Pham, Le Vesinet, and Pierre C. Lacaze, Paris, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-Sur-Seine, France

Filed Jun. 5, 1978, Ser. No. 912,740
Claims priority, application France, Jun. 10, 1977, 77 17851
Int. Cl.³ C08G 65/44
U.S. Cl. 528—210 32 Claims

1. A polyphenylene oxide film obtained by anodically oxidizing a monomer of the formula



wherein

R is C_{1-7}acyl, hydroxy, carboxy, alkoxycarbonyl, amino, alkylamino, or phenylamino; and

n is an integer or where R is acyl, 0 or an integer.

4,334,055

RESIN DERIVED FROM ACENAPHTHENE, PROCESS FOR ITS PRODUCTION AND INTERMEDIATES IN ITS PRODUCTION

Joseph G. Robinson, Winchcombe, and Sally A. Brain, Evesham, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Aug. 11, 1981, Ser. No. 292,037
Claims priority, application United Kingdom, Aug. 29, 1980, 8027953
Int. Cl.³ C08G 12/00
U.S. Cl. 528—229 10 Claims

1. A process for the production of a thermally stable resin comprising the steps of:

(1) reacting acenaphthene with a formaldehyde donor in the presence of an acid catalyst to produce a low molecular weight resin comprising oligomers of acenaphthene moieties joined by substantially only methylene bridges;

(2) oxidising the low molecular weight resin to form an intermediate resin comprising naphthalic acid units joined by keto bridges; and

(3) reacting the intermediate resin with a di- or tetra-functional primary aromatic amine to produce the thermally stable resin.

4,334,056

METHOD FOR POLYTROPICALLY PRECIPITATING POLYAMIDE POWDER COATING COMPOSITIONS WHERE THE POLYAMIDES HAVE AT LEAST 10 ALIPHATICALLY BOUND CARBON ATOMS PER CARBONAMIDE GROUP

Klaus-Rudolf Meyer, Hattingen; Karl-Heinz Hornung, Marl; Rainer Feldmann, Marl, and Hans-Jürgen Smigerski, Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Filed Feb. 20, 1980, Ser. No. 123,030
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1979, 2906647
Int. Cl.³ C08G 69/46
U.S. Cl. 528—496 11 Claims

1. A method of producing polyamide powder from polyamide having a relative viscosity of 1.4 to 1.8 as measured in 0.5% meta-cresol solution at 25° C. and at least 70% of said polyamide consisting of polyamide with at least 10 aliphatically bound carbon atoms per carbonamide group, comprising:

(a) dissolving said polyamide in at least twice the amount by weight of ethanol in a closed vessel at a temperature between about 130° to 150° C. to form a solution of said polyamide;

(b) cooling said solution to a precipitation temperature between about 100° and 125° C. and ceasing said cooling at said precipitation temperature;

(c) precipitating said polyamide powder from said cooled solution of (b) polytropically with agitation and under an inert gas atmosphere; and

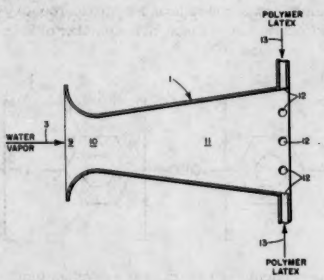
(d) separating said precipitated polyamide powders of (c) from said ethanol.

4,334,057

CONTINUOUS PROCESS FOR RECOVERING POLYMERS FROM THEIR LATEXES

Gabriele Govoni, Renazzo; Gianfranco Rubichi, and Pierluigi Guardigli, both of Ferrara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Dec. 19, 1980, Ser. No. 218,085
Claims priority, application Italy, Dec. 20, 1979, 28276 A/79
Int. Cl.³ C08F 6/06, 6/10
U.S. Cl. 528—500 4 Claims



1. A continuous process for the recovery of polymers from their latexes obtained by emulsion polymerization, said process consisting of the following phases:

(A) feeding the polymeric latexes containing from 10 to 50% by weight of polymer, at a temperature of from 10° to 120° C., through one or more feeding channels to the narrow zone or the divergent section of a nozzle in which water vapor flows at sonic or supersonic speed respectively, maintaining vapor latex feeding ratios of 0.1–2 kg of vapor/kg of latex, the latex being subdivided by the water vapor into a dispersion of particles; and

(B) continuously feeding the dispersion obtained in step (A) to a tube or to an exchanger of the type tube-in-tube directly connected with the divergent section of the nozzle where the dispersion, at a temperature of 100°–150° C. for residence times ranging from 0.1 to 1 second, maintains a speed of 50–150 m/sec., thus obtaining a dispersion of solid caked particles of polymer and of liquid particles in a vapor phase comprising the unreacted monomers and the water vapor, and separating the vapor phase from the dispersion.

4,334,058

RUTIN POLY(H—)SULFATE SALTS AND RELATED COMPOUNDS

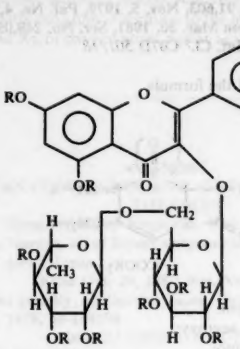
Vijay G. Nair, New York, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 62,587, Jul. 31, 1979, abandoned, which is a continuation-in-part of Ser. No. 966,423, Dec. 4, 1978, abandoned. This application Aug. 25, 1980, Ser. No. 181,251

Int. Cl.³ A61K *31/70*; C07H *13/12, 11/00*

U.S. Cl. 536—8 6 Claims

1. A rutin poly(H—)sulfate of the formula:



wherein each R is selected from the group consisting of hydrogen and —SO_3A; wherein A is a pharmaceutically acceptable salt cation; with the proviso that at least six of the R groups are —SO_3A.

4,334,059

SILYLATED ARABINO-BASE COMPOUNDS

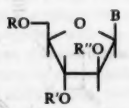
Kelvin K. Ogilvie, Candiac, Canada, assignor to Bio Logicals Inc., Toronto, Canada

Filed Oct. 20, 1980, Ser. No. 198,654

Int. Cl.³ C07H *19/06*

U.S. Cl. 536—23 7 Claims

1. Silylated arabino-cytosine compounds having the general formula:



wherein B represents an unsubstituted cytosine group and each R, R′ and R″ is independently selected from hydrogen and alkylsilyl, with the proviso that at least one R, R′ and R″ is alkylsilyl.

4,334,060

REACTOR FOR THE GAS PHASE NITRATION OF CELLULOSE

Marcel Blais, Newton, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 30, 1980, Ser. No. 202,222

Int. Cl.³ C08B *5/02*

U.S. Cl. 536—35 4 Claims

1. A continuous vapor phase process for the nitration of cellulose to produce nitrocellulose by reaction with nitric acid which comprises

introducing cellulose in porous sheet form into a reactor having a substantially gas-tight housing containing a table having a perforated surface,

passing the cellulose sheet over at least a portion of the perforated surface of said table,

introducing a stream of nitric acid vapor into said housing and through said perforations to provide a cushion of gas supporting said sheet moving over said table and force nitric acid vapor through said porous cellulose sheet,

contacting said sheet with said nitric acid vapor for a sufficient period to nitrate the cellulose to a nitrogen content of at least about 7%, and

continuously removing from said housing unreacted nitric acid vapor and water vapor formed in the reaction and the nitrocellulose sheet thus produced.

4,334,061

PROCESS FOR RECOVERY OF POLYOL FATTY ACID POLYESTERS

Joseph A. Bossier, III, Greenwell Springs, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 29, 1979, Ser. No. 89,145

Int. Cl.³ C07H *1/00, 1/06*

U.S. Cl. 536—119 39 Claims

1. In a solvent-free, low temperature process for synthesizing polyol fatty acid polyesters by transesterification of a polyol with a fatty acid ester to produce a crude reaction product containing a dark, liquid mixture of the product polyol fatty acid polyester, fatty acid alkyl esters, alkali metal fatty acid soaps and color-forming impurities, the improvement which comprises treating the crude reaction product to obtain the polyol fatty acid polyesters contained therein by the steps of contacting the crude reaction product with an aqueous washing medium while maintaining the resultant mixture at a pH of from 7 to about 12, inclusive, in the presence of an emulsion decreasing organic solvent at a temperature of from about 25° C. to about 100° C. for a period of time of from about 15 minutes to at least three hours to dissolve substantial amounts of fatty acid soaps and color-forming impurities in the aqueous phase, allowing the phases to settle into an organic phase and an aqueous phase and separating the organic from the aqueous phase.

5. The process of claim 1 in which said polyol fatty acid polyester is sucrose.

4,334,062

CEPHALOSPORANIC ACID DERIVATIVES

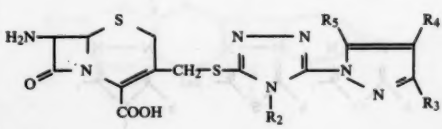
William V. Curran, Pearl River, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 24, 1980, Ser. No. 200,236

Int. Cl.³ C07D *501/18*

U.S. Cl. 544—026 4 Claims

1. A compound selected from those of the formula:



wherein

R_2 is selected from the group hydrogen, amino, C_1 to C_6 alkylamino and di-C_1 to C_6-alkylamino;

R_3, R_4, and R_5 are the same or different and are selected from the group hydrogen, hydroxy, C_1 to C_6 alkyl, C_1 to C_6 alkoxy, trifluoromethyl, phenyl, substituted phenyl, heterocyclic aryl, and R_3 and R_4 or R_4 and R_5 taken together are the moiety $—CH_2—(CH_2)_2—CH_2—$;

wherein the substituents on the phenyl are mono- or di-substituents which are the same or different and which are selected from the group C_1 to C_3 alkyl, C_1 to C_3 alkoxy, fluoro, chloro, bromo, and trifluoromethyl; and

wherein the heterocyclic aryl is selected from the group of five- and six-membered aromatic ring compounds containing one to three heteroatoms which are the same or different and which are selected from the group oxygen, nitrogen, and sulfur, and wherein said heterocyclic aryl is optionally substituted as defined above for substituted phenyl;

and the pharmaceutically acceptable non-toxic salts thereof.

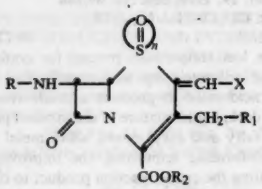
4,334,063

CEPHALOSPORIN VINYL HALIDES

Douglas O. Spry, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 91,603, Nov. 5, 1979, Pat. No. 4,299,954.
This application Mar. 30, 1981, Ser. No. 249,055
Int. Cl.³ C07D *501/20*
U.S. Cl. 544—28 **7 Claims**

1. A compound of the formula

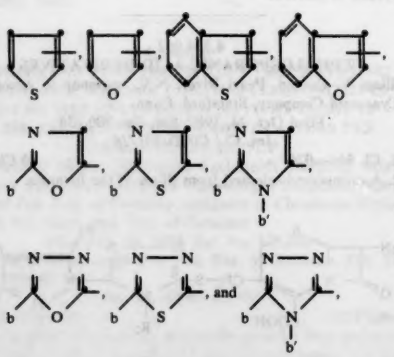


wherein R is an acyl group

wherein R′ is a heteroarylmethyl group of the formula

R‴—CH_2—

wherein R‴ is selected from the group consisting of



wherein each b is hydrogen, C_1–C_4 alkyl or amino, and each b′ is hydrogen or C_1–C_4 alkyl;

R_1 is hydrogen or acetoxy;

X is chloro or bromo;

R_2 is hydrogen or a carboxylic acid protecting group; and n is 0 or 1.

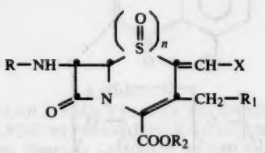
4,334,064

CEPHALOSPORIN VINYL HALIDES

Douglas O. Spry, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 91,603, Nov. 5, 1979, Pat. No. 4,299,954.
This application Mar. 30, 1981, Ser. No. 249,056
Int. Cl.³ C07D *501/18*
U.S. Cl. 544—30 **1 Claim**

1. A compound of the formula



wherein R is hydrogen;

R_1 is hydrogen or acetoxy;

X is chloro or bromo;

R_2 is hydrogen or a carboxylic acid protecting group; and n is 0 or 1.

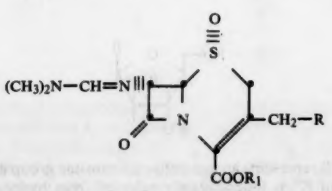
4,334,065

CEPHALOSPORIN INTERMEDIATES

Robert R. Chauvette, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 24, 1980, Ser. No. 209,440
Int. Cl.³ C07D *501/18*
U.S. Cl. 544—30 **13 Claims**

1. A compound of the formula



wherein R is hydrogen or acetoxy; R_1 is a carboxy protecting group; and the acid addition salts thereof.

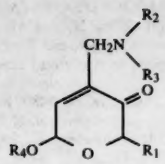
4,334,066

HETEROCYCLIC CONTAINING 5-OXO PYRANS

Yasuo Shimizu; Hisashi Takao, both of Tokushima; Shoji Asano, Kitamura; Shuya Shimada, and Kazutoshi Kikkawa, both of Tokushima, all of Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Japan

Filed Apr. 20, 1981, Ser. No. 255,817
Int. Cl.³ C07D *295/10*
U.S. Cl. 544—149 **2 Claims**

1. A pyran derivative represented by the formula



(I)

wherein R_1 and R_4 are each the same or different alkyl having 1 to 6 carbon atoms, R_2 and R_3, when attached to a nitrogen atom, forms a saturated heterocyclic ring which has as a hetero atom a nitrogen atom in addition to the nitrogen atom attached to R_2 and R_3, or oxygen atom, and an acid addition salt thereof.

4,334,067

FLAVAN COMPOUNDS AND ACID ADDITION SALTS THEREOF

Sachio Ohno; Mitsuaki Nagasaka, both of Aichi, and Kazuo Kato, Nagoya, all of Japan, assignors to Maruko Seiyaku Co., Ltd., Aichi, Japan

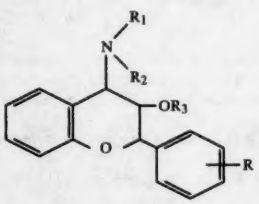
Filed Oct. 29, 1980, Ser. No. 201,877

Claims priority, application Japan, Oct. 29, 1979, 54-139685; Nov. 7, 1979, 54-144194

Int. Cl.³ C07D *413/04, 311/68*

U.S. Cl. 544—151 **8 Claims**

1. A flavan compound represented by the formula (I)



(I)

wherein R represents hydrogen or an alkoxy group, R_1 represents hydrogen or an alkyl group, R_2 represents an alkyl group, a hydroxyalkyl group or a substituted aminoalkyl group, or R_1 and R_2, when taken together with the nitrogen atom to which they are attached, can form a piperidino group, an N-substituted piperazino group or a morpholino group, and R_3 represents hydrogen or an acetyl group, with the proviso that when R is hydrogen, R_2 is a substituted aminoalkyl group, and the pharmaceutically acceptable acid addition salts thereof.

4,334,068

PROCESS FOR THE PREPARATION OF TRIAZINYLAMINO-ANTHRAQUINONES

Rütger Neeff, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

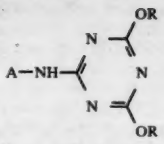
Filed Dec. 4, 1980, Ser. No. 213,242

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1979, 2950876

Int. Cl.³ C07D *251/46, 403/12, 417/12*

U.S. Cl. 544—187 **4 Claims**

1. A process for the preparation of a monoanthraquinonyl-amino-diaryloxy-triazine of the formula



wherein

A is an anthraquinone radical and

R is an aryl radical, comprising condensing one mol of the corresponding amino-anthraquinone with one mol of cyanuric chloride and an excess of the corresponding phenol at elevated temperature in a one-stage procedure in the absence of acid acceptors and extraneous organic solvents.

4,334,069

CHEMILUMINESCENT PHTHALHYDRAZIDE-LABELED HAPTEN CONJUGATES

Robert T. Buckler, Edwardsburg, Mich., and Hartmut R. Schroeder, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jul. 24, 1978, Ser. No. 927,621

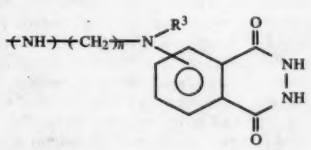
Int. Cl.³ C07D *237/32*

U.S. Cl. 544—237 **10 Claims**

1. A chemiluminescent-labeled conjugate of the formula:

L(CO)—(NH)labeling substance

wherein L(CO)— is a hapten of molecular weight greater than 100 bound to said labeling substance through an amide bond, characterized in that said —(NH)labeling substance has the formula:



wherein R^3 is hydrogen or straight chain alkyl having 1–4 carbon atoms and n=2–8.

4,334,070

CYCLOALKA[4,5]PYRROLO[2,3-g]ISOQUINOLINES

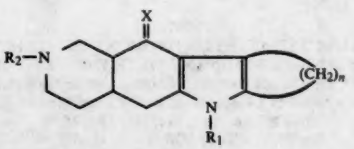
Leo Berger, Montclair, and Gary L. Olson, Westfield, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 216,116, Dec. 15, 1980, abandoned, which is a continuation-in-part of Ser. No. 125,604, Feb. 28, 1980, abandoned. This application Feb. 2, 1981, Ser. No. 230,765

Int. Cl.³ C07D *471/04;* A61K *31/475*

U.S. Cl. 546—70 **51 Claims**

1. A compound of the formula



A

wherein

R_1 is hydrogen; alkyl of 1 to 7 carbon atoms; alkanoyl of 1 to

7 carbon atoms; benzoyl; fluorobenzoyl; phenyl or phenyl substituted by halogen, trifluoromethyl, alkyl of 1 to 7 carbon atoms, alkoxy of 1 to 7 carbon atoms, nitro, amino, alkylamino of 1 to 7 carbon atoms or di-alkyl amino of 1 to 7 carbon atoms, wherein phenyl or substituted phenyl is linked to an alkylene of 1 to 4 carbon atoms;

R_2 is hydrogen; alkyl of 1 to 7 carbon atoms; hydroxyalkyl of 1 to 7 carbon atoms; hydroxyalkyl of 1 to 7 carbon atoms bearing as a substituent phenyl or phenyl substituted by halogen, trifluoromethyl, alkyl of 1 to 7 carbon atoms, alkoxy of 1 to 7 carbon atoms, nitro, amino, alkylamino of 1 to 7 carbon atoms or di-alkylamino of 1 to 7 carbon atoms; alkoxyalkyl wherein each alkyl group is of 1 to 7 carbon atoms; alkanoyloxy of 1 to 7 carbon atoms-alkyl of 1 to 7 carbon atoms; benzoyloxy-alkyl of 1 to 7 carbon atoms; 4-fluorobenzoyloxy-alkyl of 1 to 7 carbon atoms; alkanoyl of 1 to 7 carbon atoms-alkyl of 1 to 7 carbon atoms; benzoyl alkyl of 1 to 7 carbon atoms; 4-fluorobenzoyl-alkyl of 1 to 7 carbon atoms; phenyl or phenyl substituted by halogen, trifluoromethyl, alkyl of 1 to 7 carbon atoms, alkoxy of 1 to 7 carbon atoms, nitro, amino, alkylamino of 1 to 7 carbon atoms or di-alkylamino of 1 to 7 carbon atoms, wherein phenyl or substituted phenyl is linked to an alkylene of 1 to 4 carbon atoms; alkenyl of 2 to 7 carbon atoms; cycloalkyl of 3 to 6 carbon atoms-alkyl of 2 to 7 carbon atoms; alkynyl of 2 to 7 carbon atoms; thienyl-alkyl of 1 to 7 carbon atoms; furylalkyl of 1 to 7 carbon atoms; phenylcarboxamido-alkyl of 1 to 7 carbon atoms; phenylcarboxamido-alkyl of 1 to 7 carbon atoms wherein phenyl is substituted by halogen, trifluoromethyl, alkyl of 1 to 7 carbon atoms, alkoxy of 1 to 7 carbon atoms, nitro, amino, alkylamino of 1 to 7 carbon atoms or di-alkylamino of 1 to 7 carbon atoms; phenyl-alkenyl of 2 to 7 carbon atoms; phenyl-alkenyl of 2 to 7 carbon atoms wherein phenyl is substituted by halogen, trifluoromethyl, alkyl of 1 to 7 carbon atoms, alkoxy of 1 to 7 carbon atoms, nitro, amino, alkylamino of 1 to 7 carbon atoms or di-alkylamino of 1 to 7 carbon atoms; alkenyloxy of 2 to 7 carbon atoms-alkyl of 1 to 7 carbon atoms; phenyloxy-alkyl of 1 to 7 carbon atoms; phenyloxy-alkyl of 1 to 7 carbon atoms wherein phenyl is substituted by halogen, trifluoromethyl, alkyl of 1 to 7 carbon atoms, alkoxy of 1 to 7 carbon atoms, nitro, amino, alkylamino of 1 to 7 carbon atoms or di-alkylamino of 1 to 7 carbon atoms; phenyl-alkoxy of 1 to 4 carbon atoms-alkyl of 1 to 7 carbon atoms; phenyl-alkoxy of 1 to 4 carbon atoms-alkyl of 1 to 7 carbon atoms wherein phenyl is substituted by halogen, trifluoromethyl, alkyl of 1 to 7 carbon atoms, alkoxy of 1 to 7 carbon atoms, nitro, amino, alkylamino of 1 to 7 carbon atoms or di-alkylamino of 1 to 7 carbon atoms; phenyl-N-imidazolonylalkyl of 1 to 7 carbon atoms; or phenyl-N-imidazolonyl-alkyl of 1 to 7 carbon atoms wherein phenyl is substituted by halogen, trifluoromethyl, alkyl of 1 to 7 carbon atoms, alkoxy of 1 to 7 carbon atoms, nitro, amino, alkylamino of 1 to 7 carbon atoms or di-alkylamino of 1 to 7 carbon atoms;

X is O or S; and n is 3, 4, 5 or 6,

or its pharmaceutically acceptable acid addition salt.

4,334,071

17-CYCLOBUTYLMETHYL-3-HYDROXY-8β-METHYL-6-METHYLENE-MORPHINANE METHANESULFONATE

Michael P. Kotick, and Joseph O. Polazzi, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Feb. 2, 1981, Ser. No. 230,726

Int. Cl.³ C07D *221/28;* A61K *31/485*

U.S. Cl. 546—74 **1 Claim**

1. 17-cyclobutylmethyl-3-hydroxy-8β-methyl-6-methylene-morphinane methanesulfonate.

4,334,072

LACTONE COMPOUNDS CONTAINING AN INDOLIZINE RADICAL

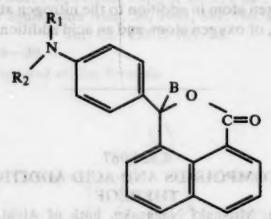
William J. Becker; Sheldon Farber, and Troy E. Hoover, all of Appleton, Wis., assignors to Appleton Papers Inc., Appleton, Wis.

Division of Ser. No. 112,500, Jan. 16, 1980, Pat. No. 4,275,206, which is a continuation-in-part of Ser. No. 17,764, Mar. 5, 1979, Pat. No. 4,232,887. This application Sep. 29, 1980, Ser. No. 192,152

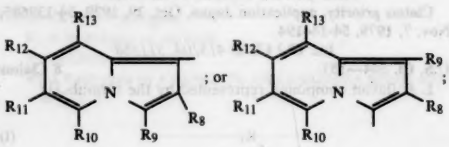
Int. Cl.³ C07D *401/14, 405/14*

U.S. Cl. 546—112 **20 Claims**

1. A compound represented by the formula:



wherein B is:



R_1 and R_2 are: hydrogen or alkyl of one to four carbon atoms,

R_8 is: phenyl, phenyl which is substituted by methoxy, phenyl, chloro or dimethylamino or alkyl of one to four carbon atoms,

R_9 is: hydrogen, alkyl of one to four carbon atoms or phenyl; and

R_{10}, R_{11}, R_{12} and R_{13} are: hydrogen or alkyl of one to four carbon atoms.

4,334,073

PROCESS FOR THE PREPARATION OF ALPHA-HYDROXYCARBOXYLIC ACID AMIDE COMPOUNDS

Hans-Joachim Diehr, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

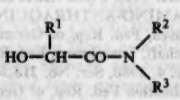
Continuation-in-part of Ser. No. 114,469, Jan. 23, 1980, abandoned. This application Dec. 1, 1980, Ser. No. 211,989

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1979, 2904490

Int. Cl.³ C07D *211/16, 85/24*

U.S. Cl. 546—245 **16 Claims**

1. Process for the preparation of an alpha-hydrocarboxylic acid amide compound of the formula



(I)

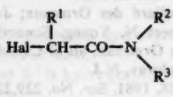
wherein

R^1 is hydrogen or alkyl; and

R^2 and R^3 are individually selected from hydrogen, alkyl, alkenyl, alkynyl, aralkyl, cycloalkyl or aryl, each of which

may be optionally substituted, or a nitrogen-containing heterocyclic radical; or

R^2 and R^3, together with the nitrogen atom to which they are bonded, represent an optionally benzo-fused monocyclic or bicyclic ring, which ring may be substituted and may be partially unsaturated, which process comprises reacting in a first stage an alpha-halocarboxylic acid amide of the formula

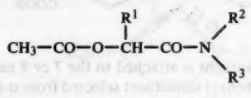


(II)

wherein

R^1, R^2 and R^3 are identified as above with the proviso that R^1, R^2 and R^3 are not all hydrogen; and

Hal is chlorine or bromine, with an alkali metal acetate or alkaline earth metal acetate in the presence of a quaternary ammonium salt and as a diluent wherein the reactants are suspended, an aliphatic or aromatic optionally chlorinated hydrocarbon, at a temperature between 20° and 200° C., and, in a second stage, deacylating the alpha-acetoxycarboxylic acid amide produced, having the general formula



(III)

in which R^1, R^2 and R^3, are identified as above by reacting said amide III with an alcohol of the general formula

R^4-OH (IV),

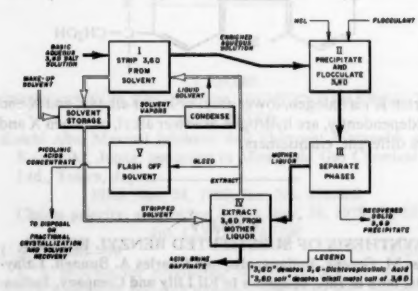
in which R^4 is alkyl in the presence of a catalytic amount of a catalyst selected from alkali metal hydroxides, alkaline earth metal hydroxides, alkali metal carbonates, and alkaline earth metal carbonates, at a temperature between 20° and 150° C.

4,334,074

METHOD OF RECOVERING 3,6-DICHLOROPICOLINIC ACID FROM BASIC AQUEOUS SOLUTIONS OF SALTS THEREOF

Russell R. Peterson, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 2, 1981, Ser. No. 230,783
Int. Cl.[3] C07D *213/55*
U.S. Cl. 546—327 11 Claims



1. The method of recovering 3,6-dichloropicolinic acid from a basic, aqueous feed solution of an alkali metal salt thereof which comprises:

a. providing as said solution one containing the free hydroxide of said alkali metal,

b. intimately contacting the aqueous solution with a solution of 3,6-dichloropicolinic acid in a water-immiscible solvent, thereby stripping the acid from said solvent and converting it to more of said salt,

c. separating the thus-stripped solvent from the resulting mixture of the additional salt with said feed solution,

d. adding to said mixture a flocculant and hydrochloric acid, the latter in an amount such as to reduce the pH of the mixture to a value of about 2 or less, thereby converting the alkali metal 3,6-dichloropicolinate present to the free acid and precipitating solid particles of free 3,6-dichloropicolinic acid,

e. removing said particles from the resultant slurry, thereby producing an aqueous mother liquor having 3,6-dichloropicolinic acid dissolved therein,

f. extracting the latter acid from said mother liquor by intimately contacting the liquor with said stripped solvent, then separating the resultant extract of 3,6-dichloropicolinic acid in said solvent, and

g. employing the extract, as in the preceding step b, in treating more of said feed solution by said method.

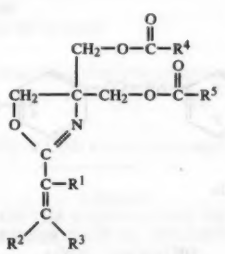
4,334,075

OXAZOLINE DIESTERS

Clifford H. Strolle, Springfield, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 22, 1980, Ser. No. 189,060
Int. Cl.[3] C07D *263/14*
U.S. Cl. 548—239 9 Claims

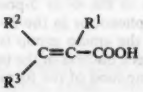
1. An oxazoline diester, capable of rapid air-drying, of the formula



wherein R^1 and R^2 are the same or different and are H, aryl, or C_1–C_4 alkyl; R^3 is alkyl, aryl, or carboxyl; and R^4 and R^5 are the same or different and are each the residue of an aliphatic carboxylic acid that has 6 or more carbon atoms or an aromatic carboxylic acid.

6. A process for preparing a monomeric oxazoline diester comprising the steps of

(a) reacting 0.8–1.25 moles of tris(hydroxymethyl) aminomethane with 1 mole of a non-terminally unsaturated carboxylic acid of the formula



where R^1 and R^2 are the same or different and are H, aryl, or C_1–C_4 alkyl and R^3 is alkyl, aryl, or carboxyl; and

(b) esterifying the reaction product of (a) with an acid selected from the group consisting of aliphatic carboxylic acids having at least 6 carbon atoms, aromatic carboxylic acids, and mixtures of these in a molar ratio of said acid to said reaction product of about 2:1

wherein reactions (a) and (b) are carried out at atmospheric

pressure and reflux conditions and in the absence of a polymerization inhibitor, and wherein the oxazoline diester is produced in monomeric form.

4,334,076

PROCESS FOR THE PREPARATION OF SULFURIC ACID SEMIESTER ETHYLSULFONYL COMPOUNDS OF AMINOPHENOLS, AMINOBENZANILIDES OR PHENYLPYRAZOLONES BY ESTERIFICATION WITH SULFURIC ACID AND/OR SULFUR TRIOXIDE IN A KNEADER

Hans H. Steuernagel, Kelkheim; Ernst Hoyer, and Fritz Meininger, both of Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 1, 1977, Ser. No. 820,884

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1976, 2634783; Aug. 3, 1976, 2634856; Aug. 3, 1976, 2634857

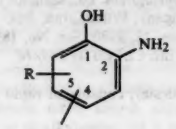
Int. Cl.³ C07C *139/00, 139/10;* **C07D** *231/02, 231/34*

U.S. Cl. 548—375 **13 Claims**

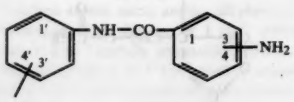
1. In a process for the preparation of a compound of the formula

$$Q\text{-}SO_2\text{—}CH_2\text{—}CH_2\text{—}OSO_3H$$

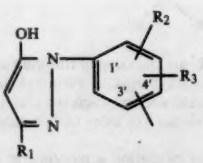
in which Q- represents a radical of the formula



of the formula



or of the formula



in which R is hydrogen, lower alkoxy, lower alkyl, nitro, chlorine, or bromine, R_1 is methyl, carboxyl or phenyl, R_2 is hydrogen, methyl, ethyl, methoxy, ethoxy or chlorine, and R_3 is hydrogen, methyl, ethyl, methoxy or ethoxy, the β-sulfatoethylsulfonyl group is in the 4- or 5-position of the benzene nucleus of the aminophenol or in the 3'- or 4'-position of the benzene nucleus and the amino group is bonded in the 3- or 4-position to the benzene nucleus of the benzoyl radical, by the esterification of a compound of the formula

$$Q\text{-}SO_2\text{—}CH_2\text{—}CH_2\text{—}OH,$$

in which Q- and R, R_1, R_2 and R_3 therein have the meanings given above and the β-hydroxyethylsulfonyl group is in the 4- or 5-position of the benzene nucleus of the aminophenol or in the 3'- or 4'-position of the benzene nucleus, and the amino group is bonded in the 3- or 4-position to the benzene nucleus of the benzoyl radical, the improvement which comprises carrying out the esterification in a machine operating with a kneading action and with the action of 1 to 2.5 times the equimolar amount, calculated on SO_3, of sulfur trioxide or sulfuric acid containing sulfur trioxide.

4,334,077

STEREOSPECIFIC SULFOXIDATION OF DIBENZO THIEPINS

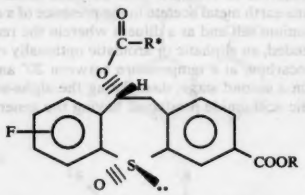
Patrice C. Belanger, Dollard des Ormeaux; Joshua Rokach, Chomedey-Laval; Robert N. Young, Senneville, and John Scheigetz, Dollard des Ormeaux, all of Canada, assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 28, 1981, Ser. No. 229,223

Int. Cl.³ C07D *337/14*

U.S. Cl. 549—12 **3 Claims**

1. A compound of the formula:



wherein the F substituent is attached to the 7 or 8 carbon; R* is an α-substituted benzyl substituent selected from α-methoxy-α-trifluoromethylbenzyl and α-methoxy benzyl; and R is a lower alkyl substituent.

4,334,078

DIBENZOTHIOPHENES

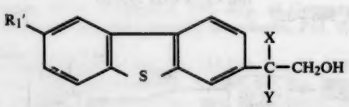
Leo Berger, Montclair; John T. Plati, Rutherford, and Albert Ziering, Nutley, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 68,297, Aug. 20, 1979, abandoned, which is a continuation of Ser. No. 861,747, Dec. 19, 1977, abandoned, which is a division of Ser. No. 669,940, Mar. 24, 1976, abandoned. This application Dec. 22, 1980, Ser. No. 219,135

Int. Cl.³ C07D *333/76*

U.S. Cl. 549—43 **3 Claims**

1. A compound of the formula



wherein R'_1 is halogen, lower alkyl or lower alkoxy, and X and Y, independently, are hydrogen or lower alkyl, or, when X and Y are different, enantiomers.

4,334,079

SYNTHESIS OF SUBSTITUTED BENZYL ESTERS

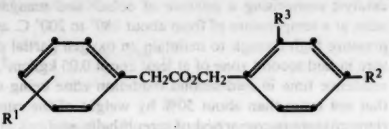
James M. Greene, Indianapolis, and Charles A. Bunnell, Lafayette, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 3, 1980, Ser. No. 203,736

Int. Cl.³ C07C *69/76*

U.S. Cl. 560—75 **25 Claims**

1. A process for preparing a compound of the formula

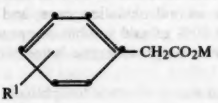


wherein

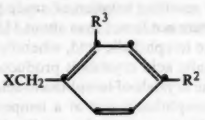
R^1 is hydroxy, protected hydroxy, hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy or halo;

one of R^2 and R^3 is hydrogen and the other is phenoxy or C_1–C_6 alkoxy;

by reacting a compound of the formula



with a compound of the formula



wherein M is sodium or potassium, and X is chloro or bromo; in an organic solvent which is inert to esterification and in which the phenylacetic acid salt is substantially insoluble, and in the presence of a catalytic amount of a phase transfer catalyst of the formula

$$X^1NR^4R^5R^6R^7$$

wherein

X^1 is chloro, bromo, iodo, toluenesulfonate or methanesulfonate;

R^4 and R^5 are independently C_1–C_{16} alkyl, phenyl or benzyl;

R^6 and R^7 are independently C_1–C_{16} alkyl;

provided that, when X^1 is a group other than iodo, the process is carried out in the presence of from about 0.1 to about 0.5 mole of an alkali metal iodide per mole of product to be produced.

4,334,080

PROCESS FOR PRODUCING BENZENE CARBOXYLIC ACID ESTER

Koichi Abe; Masami Ishihara, and Thuyoshi Watanabe, all of Kurashiki, Japan, assignors to Mitsubishi Gas Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1980, Ser. No. 210,058

Claims priority, application Japan, Nov. 26, 1979, 54/152650

Int. Cl.³ C07C *67/08*

U.S. Cl. 560—99 **5 Claims**

1. A process for producing benzenecarboxylic acid ester which comprises reacting benzenecarboxylic acid having 8 to 10 carbon atoms or its anhydride with aliphatic alcohol having 7 to 11 carbon atoms in the presence of an amorphous aluminum compound represented by the formula $Al_x(CO_3)_y(OH)_z.nH_2O$, wherein x:y = 8–6:1 and x:z = 11–8:4–3, as a catalyst and an alkali metal compound as a promoter.

4,334,081

PREPARATION OF SUBSTITUTED OLEFINS

Ismael Colon, Middlesex, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 23, 1981, Ser. No. 227,931

Int. Cl.³ C07C *69/157, 15/44, 15/46, 2/60*

U.S. Cl. 560—130 **11 Claims**

1. A method of preparing substituted olefins which comprises reacting organic halides free of nitro and acidic functional groups with an olefin which has 2 to 18 carbons and is free of nitro substituents in an aprotic solvent system, optionally containing a mixture of polar and nonpolar solvents with a catalytic amount of a catalyst mixture consisting essentially of:

(1) a nickel compound containing no radicals in which N and O are bonded directly together;

(2) a triarylphosphine having 6 to about 14 carbons in each aryl moiety, and

(3) zinc metal, at a temperature of up to about 250° C.;

wherein the ratio of gram atoms of nickel per mole of organic halide is about 0.001 to about 1, the ratio of triarylphosphine to nickel is about 1 to about 100 moles per gram atom of nickel and the amount of zinc in relation to that of nickel is about 1 to 100 fold excess over that of the stoichiometric amount required to reduce all of the nickel present initially.

4,334,082

DIALKYL PERFLUORO-ω-FLUOROFORMYL DIESTERS AND MONOMERS AND POLYMERS THEREFROM

Paul R. Resnick, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 26, 1980, Ser. No. 191,301

Int. Cl.³ C07C *69/708*

U.S. Cl. 560—180 **5 Claims**

1. A diester of the formula:

$$(RO_2CCF_2)_2CFO(CFCF_2O)_nCFCOF$$
$$\quad\quad\quad

rosulphinate of the alkyl lactate, which process comprises, during the first step, gradually bringing the alkyl lactate into contact with the thionyl chloride, in the presence of 0.05–2% by weight of pyridine based on the weight of said alkyl lactate, whilst maintaining, in the reaction mixture, a molar excess of thionyl chloride of at least 2.5%, relative to the amount of alkyl lactate introduced into this mixture, at a temperature which is kept below the decomposition point of the chlorosulphinate of the alkyl lactate during the first step, and, in the second step, heating the reaction mixture resulting from the first step at a temperature which is at least equal to the decomposition point of the chlorosulphinate of the alkyl lactate.

4,334,084

ORGANIC ACIDS AND PROCESS FOR PREPARING SAME

Johann G. D. Schulz, Pittsburgh, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed May 30, 1978, Ser. No. 910,215
Int. Cl.³ C07C *51/373, 51/47*
U.S. Cl. 562—410 **10 Claims**

1. In a process for preparing a mixture of polycyclic, aromatic, polycarboxylic acids carrying nuclear nitro groups that is soluble in a mixture consisting essentially of acetone or methyl ethyl ketone and methyl alcohol or isopropyl alcohol but insoluble in water which consists essentially in subjecting a slurry containing coal to reaction with aqueous nitric acid having a concentration of about 5 to about 90 percent at a temperature of about 15° to about 200° C. for about 0.5 to about 15 hours and mechanically separating the solids in the resulting slurry, the improvement which consists essentially in extracting said separated solids with a mixture consisting essentially of acetone or methyl ethyl ketone and methyl alcohol or isopropanol in amounts to form an azeotropic mixture and then separating said ketone and said alcohol from the extract to obtain said mixture of polycyclic, aromatic, polycarboxylic acids.

4,334,085

TRANSAMINATION PROCESS FOR MANNICH PRODUCTS

Robert J. Basalay, Naperville, and John H. Udelhofen, Wheaton, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 14, 1978, Ser. No. 942,187
Int. Cl.³ C07C *87/28*
U.S. Cl. 564—367 **8 Claims**

1. A transamination process for Mannich products comprising the reaction of a polyamine comprising at least two nitrogen atoms separated by at least an ethylene group with a substantially formaldehyde-free mononitrogen Mannich adduct.

4,334,086

PRODUCTION OF TEREPHTHALIC ACID

Jacques D. V. Hanotier, and Monique J. S. Hanotier-Bridoux, both of Lasne Chapelle St. Lambert, Belgium, assignors to Labofina S.A., Brussels, Belgium

Filed Mar. 16, 1981, Ser. No. 244,141
Int. Cl.³ C07C *51/16*
U.S. Cl. 562—413 **9 Claims**

1. A process for the continuous production of terephthalic acid from p-xylene, comprising the steps of:

(a) oxidizing p-xylene in a first oxidation zone at a temperature between about 130° and 170° C. in the presence of not more than about 10 weight % of water and a catalyst comprising a mixture of cobalt and manganese salts, the residence time in the first oxidation zone being such that not more than about 15% by weight of the equilibrium reaction is comprised of terephthalic acid;

(b) oxidizing the partially-oxidized compounds formed in said first oxidation zone in a second oxidation zone in the presence of an additional amount of water up to a concentration of from about 20 to 70% by weight of the liquid phase and in the presence of an additional amount of a catalyst comprising a mixture of cobalt and manganese salts, at a temperature of from about 180° to 200° C. and a pressure high enough to maintain an oxygen partial pressure in said second zone of at least about 0.05 kg/cm², the residence time in said second oxidation zone being such that not more than about 50% by weight of the equilibrium mixture is comprised of terephthalic acid;

(c) stripping p-xylene vapors from said second oxidation zone;

(d) separating crystals of crude terephthalic acid from the effluent from said second oxidation zone from the soluble components of said effluent;

(e) countercurrently washing the separated crystals with fresh water to produce a slurry;

(f) recycling from about 80 to 98% of said soluble components to the second oxidation zone, and recycling from about 2 and 20% of said soluble components to the first oxidation zone to provide the latter with heavy metal catalyst;

(g) heating said slurry of crude terephthalic acid crystals to a temperature at least about 5° C. higher than necessary for dissolving the crude terephthalic acid and having the resulting solution saturated with terephthalic acid;

(h) cooling the resulting solution of crude terephthalic acid to a temperature not lower than about 185° C. sufficient to crystallize the terephthalic acid, whereby a slurry of purified terephthalic acid crystals is produced;

(i) separating the crystals of terephthalic acid from the slurry of purified terephthalic acid at a temperature not lower than the final temperature of crystallization in step (h);

(j) countercurrently washing the separated crystals of purified terephthalic acid with fresh water; and

(k) recovering and recycling to the second oxidation zone the dissolved material present in the water solution used for said washing step (j).

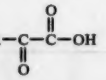
4,334,087

PROCESS FOR PREPARING α-KETOCARBOXYLIC ACIDS

Ted A. Baer, and Jeffrey N. Labovitz, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed Sep. 11, 1980, Ser. No. 186,360
Int. Cl.³ C07C *59/76, 59/80, 59/86, 62/38*
U.S. Cl. 562—459 **12 Claims**

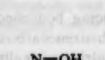
1. A process for the manufacture of an α-ketocarboxylic acid of formula (A)



(A)

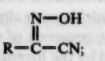
which comprises the steps of:

(a) reacting an oximinohalide of formula (I)



(I)

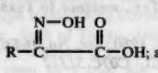
with at least one equivalent of a member selected from the group consisting of sodium cyanide, potassium cyanide and mixtures thereof to form an oximinonitrile of formula (II)



(II)

(b) reacting an oximinonitrile of formula (II) with at least

two equivalents of hydroxide ion to form an oximinoacid of formula (III)



(III)

(c) hydrolysis of said oximinoacid in an aqueous medium to form said α-ketocarboxylic acid and recovering the α-ketocarboxylic acid from the medium, wherein X is chloro, bromo or iodo and R is hydrogen or an organo group selected from the unsubstituted and substituted members of the group consisting of alkyl having from 1 to 22 carbon atoms, alkenyl having from 2 to 22 carbon atoms, alkynyl having from 2 to 22 carbon atoms, oxa-alkyl having from 2 to 22 carbon atoms, thia-alkyl having from 2 to 22 carbon atoms, cycloalkyl having from 3 to 8 carbon atoms, cycloalkalkyl having from 4 to 8 carbon atoms, cycloalkenyl having from 4 to 8 carbon atoms, aryl having from 6 to 12 carbon atoms, aralkyl having from 7 to 12 carbon atoms, and heterocyclic having from 3 to 10 carbon atoms and having 1 or 2 hetero atoms selected from oxygen, sulfur, and nitrogen, the substituted members of the group being substituted by at least one substituent from the group consisting of hydroxy, mercapto, nitro, fluoro, chloro, bromo, iodo, amino and hydrocarboxy.

4,334,088

2-ALKYNYL-5-INDANYLOXYACETIC ACIDS

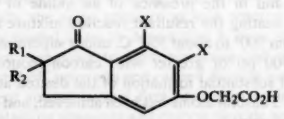
Porter C. Johnson, Evansville, Ind., and William L. Matier, Libertyville, Ill., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 190,159, Sep. 24, 1980, Pat. No. 4,291,168, which is a division of Ser. No. 27,961, Apr. 9, 1979, Pat. No. 4,247,715. This application May 21, 1981, Ser. No. 265,872

Int. Cl.³ C07C *59/76*

U.S. Cl. 562—462 **4 Claims**

1. A process for preparing an indanyloxy compound of Formula I



(I)

wherein

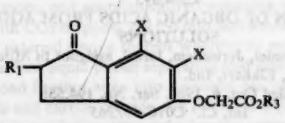
X is halo;

R_1 is phenyl or p-halophenyl;

R_2 is propargyl or 3-butynyl;

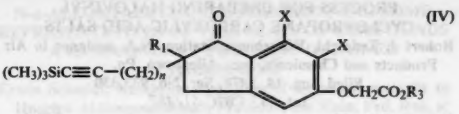
which comprises consecutive steps of:

alkynylating an indanyloxyacetate of Formula III



(III)

wherein X is halo, R_1 is phenyl or p-halophenyl and R_3 is lower alkyl of 1 to 4 carbon atoms inclusive with $(CH_3)_3SiC{\equiv}C\text{-}(CH_2)_n\text{-}Br$ in which n is 1 or 2 in the presence of a carbonate base in a reaction inert solvent such as dimethylformamide to provide a trimethylsilylalkynylindanyloxyacetic acid of Formula IV



(IV)

wherein X, n, R_1 and R_3 are as defined above; and treating the formula IV compound with sodium or potassium hydroxide in ethanol to provide the Formula I compound.

4,334,089

SUBSTITUTED OXOCARBOXYLIC ACIDS, PROCESSES FOR THEIR PREPARATION, THEIR USE AND MEDICAMENTS CONTAINING THEM

Ekkehard Kraass, Krummesse, and Horst Wolf, Constance, both of Fed. Rep. of Germany, assignors to Byk Gulden Lomberg Chemische Fabrik Gesellschaft, Constance, Fed. Rep. of Germany

PCT No. PCT/EP80/00123, § 371 Date Jun. 29, 1981, § 102(e) Date Jun. 29, 1981, PCT Pub. No. WO81/01285, PCT Pub. Date May 14, 1981

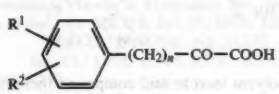
PCT Filed Oct. 31, 1980, Ser. No. 279,961

Claims priority, application Switzerland, Oct. 31, 1979, 9785/79

Int. Cl.³ C07C *62/32*

U.S. Cl. 562—463 **13 Claims**

1. Substituted oxocarboxylic acids of the general formula I



(I)

wherein

R^1 denotes a hydrogen atom, a halogen atom, a hydroxyl group, a lower alkyl group, a lower alkoxy group or a trifluoromethyl group,

R^2 denotes a hydrogen atom or a halogen atom and

n denotes an integer from 3 to 8,

excluding those wherein

R^1 denotes a hydrogen atom or a methoxy group and

R^2 denotes a hydrogen atom, if

n denotes 3,

and their salts.

4,334,090

SLURRIES OF TEREPHTHALIC ACID IN ETHYLENE GLYCOL

Peter A. Donaldson, Yarm, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Nov. 19, 1980, Ser. No. 208,348

Claims priority, application United Kingdom, Nov. 28, 1979, 7941092

Int. Cl.³ C07C *63/14, 51/42*

U.S. Cl. 562—480 **18 Claims**

1. A method of reducing the viscosity of a slurry of terephthalic acid in ethylene glycol which comprises subjecting the terephthalic acid crystals before forming the slurry to mild attrition at an elevated temperature in the absence of a solvent for a period of time sufficient to modify the crystals so that they form a slurry with ethylene glycol which has a reduced viscosity.

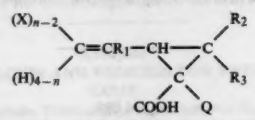
4,334,091

PROCESS FOR PREPARING HALOVINYL CYCLOPROPANE CARBOXYLIC ACID SALTS

Robert J. Tedeschi, Whitehouse Station, N.J., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 14, 1978, Ser. No. 933,330
Int. Cl.³ C07C 51/487
U.S. Cl. 562—506 6 Claims

1. A process for forming the compound having the formula



wherein:

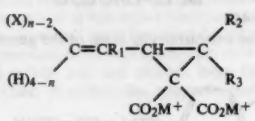
X is a halogen atom selected from the group consisting of bromine and chlorine

n is 3 or 4;

R^1 is hydrogen or a lower alkyl group having from 1–6 carbon atoms, cycloalkyl group and an aryl group;

R^2 and R^3 are lower alkyl groups having from 1–6 carbon atoms, aryl groups, cycloalkyl and aralkyl; and

Q is CO_2M+ where M is an alkali or alkaline earth metal; which comprises dispersing a compound represented by the formula:



in an organic solvent inert to said compound thereby forming a dispersion, acidifying the dispersion with aqueous mineral acid, terminating acidification at a pH of 3–4 thereby forming a precipitate and then recovering the precipitate as product compound.

4,334,092

METHOD OF PREPARING ALIPHATIC CARBOXYLIC ACIDS

John F. Knifton, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,632
The portion of the term of this patent subsequent to Apr. 7, 1998, has been disclaimed.
Int. Cl.³ C07C 51/12
U.S. Cl. 562—517 14 Claims

1. A process of preparing higher homologues of aliphatic carboxylic acids containing 2–6 carbon atoms which comprises the steps of contacting said aliphatic carboxylic acid starting material with at least a catalytic amount of a rhodium-containing compound in the presence of an iodide or bromide promoter and heating the resultant reaction mixture at a temperature of from about 100° to about 350° C. and under superatmospheric pressures of 500 psi or greater with carbon monoxide and hydrogen until substantial formation of the desired acids containing at least three (3) carbon atoms has been achieved, and recovering said desired acids.

4,334,093

METHOD OF PREPARING ALIPHATIC CARBOXYLIC ACIDS

John F. Knifton, Austin, Tex., assignor to Texaco, Inc., White Plains, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,629
Int. Cl.³ C07C 51/12
U.S. Cl. 562—517 14 Claims

1. A process of preparing higher homologues of aliphatic carboxylic acids containing 2–6 carbon atoms which comprises the steps of contacting said aliphatic carboxylic acid starting material with at least a catalytic amount of nickel-containing compound in the presence of a Group VB tertiary donor ligand wherein the key elements of the ligand is selected from the group consisting of nitrogen, phosphorus, arsenic and antimony and wherein each key element is in the trivalent oxidation state, and in the presence of an iodide or bromide promoter and heating the resultant reaction mixture at a temperature of from about 100° to about 350° C. and under superatmospheric pressures of 500 psi or greater with carbon monoxide and hydrogen until substantial formation of the desired acids containing at least 3 carbon atoms has been achieved and recovering said desired acids.

4,334,094

METHOD OF PREPARING ALIPHATIC CARBOXYLIC ACIDS

John F. Knifton, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,633
The portion of the term of this patent subsequent to Apr. 7, 1998, has been disclaimed.
Int. Cl.³ C07C 51/12, 120/00, 121/407, 148/00, 149/20
U.S. Cl. 562—517 15 Claims

1. A process of preparing higher homologues of aliphatic carboxylic acids containing 2–6 carbon atoms which comprises the steps of contacting said aliphatic carboxylic acid starting material with at least a catalytic amount of a palladium-containing compound in combination with a Group VB tertiary donor ligand and in the presence of an iodide or bromide promoter and heating the resultant reaction mixture at a temperature of from 100° to about 350° C. under superatmospheric pressures of 500 psi or greater with carbon monoxide and hydrogen until substantial formation of the desired acids containing at least 3 carbon atoms has been achieved, and recovering said desired acids.

4,334,095

EXTRACTION OF ORGANIC ACIDS FROM AQUEOUS SOLUTIONS

Avraham M. Baniel, Jerusalem, Israel, assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Oct. 6, 1980, Ser. No. 194,555
Int. Cl.³ C07C 59/265
U.S. Cl. 562—584 10 Claims

1. A process for the extraction of an organic acid selected from the class consisting of citric acid, malic acid and lactic acid from an aqueous solution thereof which comprises contacting such solution with a mixture of a water immiscible amine and a water immiscible organic acid dissolved in a suitable water immiscible solvent.

4,334,096
PROCESS FOR SYNTHESIZING UREA

Keizo Konoki, Tokyo; Michio Nobue, Funabashi; Akito Fukui, Yotsukaidomachi, and Shigeru Inoue, Kamakura, all of Japan, assignors to Toyo Engineering Corporation and Mitsui Toatsu Chemicals, Inc., both of Tokyo, Japan

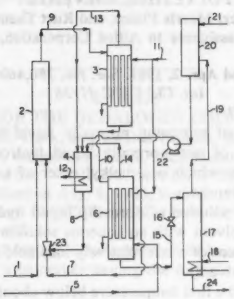
PCT No. PCT/JP79/00192, § 371 Date Mar. 24, 1980, § 102(e) Date Mar. 5, 1980, PCT Pub. No. WO80/00343, PCT Pub. Date Mar. 6, 1980

PCT Filed Jul. 24, 1979, Ser. No. 191,212

Claims priority, application Japan, Jul. 24, 1978, 53-90120

Int. Cl.³ C07C *126/02*

U.S. Cl. 564—72 10 Claims



1. In a urea synthesis process in which ammonia and carbon dioxide are reacted in a reactor, at an elevated temperature and pressure, to form a urea synthesis effluent stream containing urea, ammonium carbamate, ammonia and water, the improvement which comprises: passing said effluent stream downwardly through a first heating zone which is maintained at substantially the same pressure as said reactor and which is externally heated so as to decompose a large amount of said ammonium carbamate to form ammonia and carbon dioxide and to distill off ammonia and carbon dioxide gases; separating the effluent stream in said first heating zone into a first gas phase containing ammonia and carbon dioxide and a first liquid phase containing said urea, said water and reduced amounts of ammonium carbamate and ammonia, then passing said first liquid phase downwardly through a second heating zone which is maintained at substantially the same pressure as said reactor and which is externally heated so as to decompose ammonium carbamate in said first liquid phase to form ammonia and carbon dioxide and to distill off ammonia and carbon dioxide gases, and simultaneously contacting said first liquid phase with CO_2 stripping gas fed into said second heating zone from an external source thereof whereby to remove ammonia from said first liquid phase; separating said first liquid phase in said second heating zone into a second gas phase containing ammonia and carbon dioxide and a second liquid phase of an aqueous urea solution; then reducing the pressure of said second liquid phase and feeding same through a urea purification stage which is at a lower pressure than said reactor whereby to obtain a purified aqueous urea solution; and continuously maintaining said first gas phase and said second gas phase substantially at a pressure of said reactor and feeding said first gas phase and said second gas phase into said reactor.

4,334,097
PROCESS FOR THE PREPARATION OF N-α-ALKOXYALKYL-CARBOXAMIDES, AND SOME REPRESENTATIVES OF THIS CLASS OF COMPOUNDS AND SECONDARY PRODUCTS OBTAINED THEREFROM

Erwin Schmidt, Kelkheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 202,606, Oct. 31, 1980, abandoned. This application May 1, 1981, Ser. No. 259,367

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1979, 2944456

Int. Cl.³ C07C *102/00*

U.S. Cl. 564—201 11 Claims

1. A process for the preparation of N-α-alkoxyalkyl-carboxamides starting from primary or secondary carboxamides, which comprises reacting primary or secondary amides of aliphatic, araliphatic or aromatic carboxylic acids, or cyclic carboxamides (lactams) which are not capable of forming an aromatic system, with open-chain α-halogenoalkyl ethers with at least 3 C atoms per molecule, in the presence of tertiary amines.

4,334,098
TRANS,TRANS-Δ-DAMASCONE, MIXTURES CONTAINING MAJOR PROPORTIONS OF SAME, PROCESSES FOR PREPARING SAME AND ORGANOLEPTIC USES THEREOF

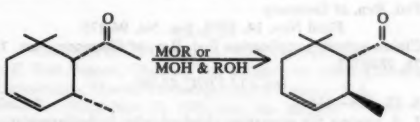
Braja D. Mookherjee, Holmdel; Robert W. Trenkle, Bricktown; Richard A. Wilson, Westfield; Frederick L. Schmitt, Holmdel; Manfred H. Vock, Locust; Edward J. Granda, Englishtown; Joaquin Vinals, Red Bank, all of N.J.; Jacob Kiwala, Brooklyn, N.Y., and William L. Schreiber, Jackson, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 928,718, Jul. 27, 1978. This application Mar. 23, 1979, Ser. No. 23,323

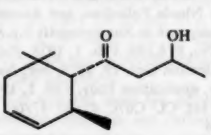
Int. Cl.³ C07C *45/66, 45/67, 45/45*

U.S. Cl. 568—347 2 Claims

1. A process for producing a composition of matter comprising more than 80% trans, trans-delta-damascone comprising the steps of (i) intimately admixing 1-alpha-acetyl-2-alpha-6,6-trimethyl-3-cyclohexene with refluxing alcoholic base or alkali metal alcoholate according to the reaction:

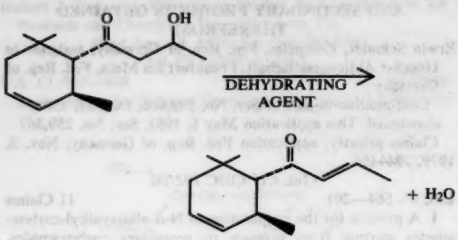


wherein R is lower alkyl, selected from the group consisting of methyl and ethyl and M is alkali metal selected from the group consisting of sodium and potassium; (ii) fractionally distilling the resulting reaction mass whereby a composition of matter containing more than 80% by weight of the trans isomer of 1-acetyl-2,6,6-trimethyl-3-cyclohexane is isolated; (iii) intimately admixing the resulting distillate containing more than 80% of the trans isomer of 1-acetyl-2,6,6-trimethyl-3-cyclohexane and less than 20% of the cis isomer of 1-acetyl-2,6,6-trimethyl-3-cyclohexane with acetaldehyde yielding a composition of matter containing more than 80% of the trans isomer of the hydroxy ketone having the structure:



(iv) dehydrating the resulting product with a dehydrating

agent selected from the group consisting of paratoluene sulphonic acid and acetic anhydride whereby trans,trans-delta-damascone is produced according to the reaction:



(v) distilling from the reaction mass a material containing 80–98% trans,trans-delta-damascone and 2–20% cis,trans-delta-damascone.

4,334,099

PREPARATION OF HEXAFLUOROACETONE FROM HEXAFLUOROTHIOACETONE DIMER

Michael Van De Puy, Cheektowaga; Louis G. Anello, Hamburg, and Martin A. Robinson, East Amherst, all of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 18, 1980, Ser. No. 217,943

Int. Cl.³ C07C *45/56*

U.S. Cl. 568—386 **8 Claims**

1. A process for preparation of hexafluoroacetone, which comprises reacting, at elevated temperatures, in the liquid phase, hexafluorothioacetone dimer in an aprotic solvent containing an effective amount of an alkali metal fluoride with at least about a stoichiometric amount of an oxidizing agent selected from the group consisting of HgO, Ag_2O, Cu_2O, CuO, P_2O_5, MIO_3 and MIO_4 wherein M is an alkali metal or alkaline earth metal.

4,334,100

PRODUCTION OF ALDEHYDES

Jens Hagen, Ketsch, and Klaus Bruns, Krefeld-Traar, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Nov. 14, 1979, Ser. No. 94,275

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1978, 2849742

Int. Cl.³ C07C *45/50*

U.S. Cl. 568—444 **1 Claim**

1. A process for preparing aldehydes by hydroformylation of monoterpene compounds, which comprises reacting a monocyclic or bicyclic monoterpene compound selected from the group consisting of limonene, camphene, β-pinene, and α-terpinene at from about 70° to 160° under a pressure of from about 100 to 400 bar and in the presence of a catalyst mixture consisting essentially of triphenyl phosphine and $RhCl(CO)[P(C_6H_5)_3]_2$.

4,334,101

METHOD FOR PREPARING METAL-CARBONYL CLUSTERS IMMOBILIZED IN ZEOLITE AND THEIR USE AS HETEROGENEOUS CATALYSTS

Elvio Mantovani; Nicola Palladino, and Antonio Zanobi, all of Rome, Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Division of Ser. No. 874,196, Feb. 1, 1978, Pat. No. 4,199,478. This application Oct. 19, 1979, Ser. No. 86,350

Claims priority, application Italy, Feb. 1, 1977, 19833 A/77

Int. Cl.³ C07C *45/50, 47/00*

U.S. Cl. 568—454 **2 Claims**

1. The use as heterogeneous catalysts in hydroformylation reactions of olefins and dienes, of metal carbonyl clusters trapped in the interior of the crystalline structure of zeolites, prepared by exchanging a zeolite with a metal in the form of a salt or an ion complex, subsequently reducing and carbonylating the metal itself, forming metal carbonyl clusters in the interior of said zeolite, hydroformylating an olefin or a diene under a pressure in a range of from about 50 to about 100 atmospheres, at a temperature in a range of from about 80° C. to about 130° C. in the presence of said zeolite having said metal carbonyl clusters trapped in the interior thereof and recovering aldehyde.

4,334,102

REMOVING LIQUID HYDROCARBONS FROM POLYETHER SOLVENTS

Wilmot H. Decker, Morris Plains, and Kurt Theurer, Flanders, both of N.J., assignors to Allied Corporation, Morristown, N.J.

Filed Apr. 2, 1981, Ser. No. 250,460

Int. Cl.³ C07C *41/38*

U.S. Cl. 568—621 **15 Claims**

1. A method of removing normally liquid hydrocarbons from a solution of said normally liquid hydrocarbons in a polyether solvent which is a dialkyl ether of a polyalkylene glycol which comprises:

(a) mixing the solution of normally liquid hydrocarbons in polyether solvent with an aqueous solution of at least 5 weight percent of a salt relatively insoluble in anhydrous polyether solvent;

(b) removing at a first temperature below about 40° C. a first organic layer containing liquid hydrocarbons from the remaining aqueous layer containing polyether solvent and salt;

(c) heating the remaining aqueous layer to a second temperature above about 40° C. where the remaining aqueous layer separates into a second organic layer containing polyether solvent and an aqueous salt solution; and

(d) removing the aqueous salt solution.

4,334,103

PROCESS FOR HETEROGENEOUS NUCLEOPHILIC SUBSTITUTION REACTIONS

Laszlo Töke; Gabor T. Szabo; Gabor Szabo; Lajos Nagy, and Istvan Rusznak, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Continuation-in-part of Ser. No. 953,164, Oct. 20, 1978, Pat. No. 4,229,366. This application Jun. 27, 1980, Ser. No. 163,431

Claims priority, application Hungary, Oct. 20, 1977, CI 1779

Int. Cl.³ C07C *17/20, 29/58, 41/01*

U.S. Cl. 568—631 **11 Claims**

1. A process for carrying out a nucleophilic substitution reaction which comprises the step of conducting the reaction in a heterogeneous system containing a nucleophilic reagent selected from the group consisting of an alkali metal, alkali earth metal or ammonium halide, hydroxide or phenolate and a benzyl halide substrate wherein one of said nucleophilic reagent and said benzyl halide substrate is in a solid state and the other is in a dissolved state, a water-immiscible solvent, water, and a phase transfer agent selected from the group consisting of a polymerizate of a lower alkylene glycol, a polymerizate of a lower alkylene glycol with a dilower alkylamine group or 1-piperidyl group terminally substituted thereon, a mixture of a polymerizate of a lower alkylene glycol and a triloweralkyl amine, and mixtures thereof.

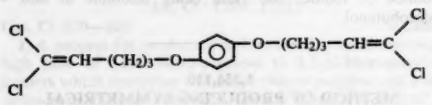
4,334,104

HYDROQUINONE DIETHER HAVING JUVENILE HORMONE AND ACARICIDE ACTIVITY

Franco Bettarini, Novara; Pietro Massardo, Milan; Paolo Piccardi, Milan, and Angelo Longoni, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 50,335, Jun. 20, 1979, abandoned. This application Oct. 20, 1980, Ser. No. 198,489
Claims priority, application Italy, Jun. 21, 1978, 24794 A/78; Mar. 5, 1979, 20734 A/79
Int. Cl.³ C07C *43/205*
U.S. Cl. 568—649 1 Claim

1. A hydroquinone diether which is 1,4-di-(5,5-dichloro-4-pentenyloxy)-benzene of formula:



4,334,105

METHOD FOR THE DEHALOGENATION OF ETHERS

Ross C. Terrell, Clark, and Kirsten Hansen, Berkeley Heights, both of N.J., assignors to Airco, Inc., Montvale, N.J.

Continuation of Ser. No. 33,293, Apr. 25, 1979, abandoned. This application Aug. 8, 1980, Ser. No. 176,297
Int. Cl.³ C07C *41/24, 41/44, 41/18*
U.S. Cl. 568—682 17 Claims

1. A method for the dehalogenation of haloethers comprising providing a haloether having the formula:

$$CX'_3\text{-}[CY_2]_n\text{-}O\text{-}CZ_2\text{-}CX_3$$

where n is 0 or 1, and wherein

(a) when n is O, CX'_3 is selected from the group consisting of CH_3 and CF_2A, where A is selected from the group consisting of H, F, Cl and Br, CZ_2 is selected from the group consisting of CF_2, CFA', and CA'_2, where A' is selected from the group consisting of Cl and Br, provided that when CZ_2 is CF_2, CX_3 is selected from the group consisting of CFA'_2 and CA'_3, when CZ_2 is CFA', CX_3 is CFA'_2, and when CZ_2 is CA'_2, CX_3 is CF_3; and provided that CZ_2 and CX_3 are not both reducible, but at least one of CZ_2 and CX_3 is reducible; and

(b) when n is 1, CZ_2 and CX_3 are the same as in (a) and either (1) CY_2 and CX'_3 are the same as CZ_2 and CX_3, respectively, in (a) or (2) CY_2 is selected from the group consisting of CF_2, CFA", CHA' and CH_2 provided that when CY_2 is CF_2, CX'_3 is selected from the group consisting of CF_3, CHFA', CHA'_2 and CF_2A", A" being selected from the group consisting of H, Cl and Br, when CY_2 is CFA", CX'_3 is selected from the group consisting of CF_3 and CF_2A', where CY_2 is CHA', CX'_3 is CF_3 and when CY_2 is CH_2, CX'_3 is selected from the group consisting of CF_3, CH_3 and CHF_2, and

contacting said haloether with a hydrogen donor comprising an amine selected from the group consisting of primary alkylamines, secondary alkyl amines, primary, secondary and tertiary alkanol amines.

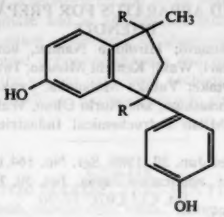
4,334,106

PROCESS FOR THE PREPARATION OF HYDROXYPHENYL-INDANOLS

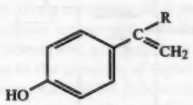
Shenghong A. Dai, Wallingford, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 5, 1981, Ser. No. 231,789
Int. Cl.³ C07C *37/11, 37/20, 39/12*
U.S. Cl. 568—719 13 Claims

1. A method for preparing a hydroxyphenyl-indanol having the formula



wherein R is lower-alkyl, comprising dissolving a phenol selected from the group consisting of an isopropenylphenol having the formula



wherein R is defined as above, oligomers thereof, and mixtures of any of said group in any combination and proportion, in a stoichiometric excess of an organic acid selected from the group consisting of trifluoroacetic acid, trichloroacetic acid, difluoroacetic acid, dichloroacetic acid, fluoroacetic acid, chloroacetic acid, formic acid, and mixtures thereof, at a temperature falling within a range of from about 0° C. to about 90° C. to form a solution; and maintaining said solution at a temperature falling within the above said range until the formation of said indanol is substantially complete.

4,334,107

CATALYTIC PURIFICATION OF PHENOL

Jan F. Van Peppen, Chester, Va., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Nov. 21, 1980, Ser. No. 208,903
Int. Cl.³ C07C *37/86, 45/00*
U.S. Cl. 568—749 6 Claims

1. A method to purify crude phenol containing acetol and alpha-methyl styrene prior to hydrogenation comprising

contacting the crude phenol with a catalyst while

heating the crude phenol and catalyst to a temperature between about 140° C. and about 190° C.

at a pressure between about atmospheric and about 70 psig. in an inert atmosphere

so that the catalyst causes a reaction between the impurities acetol and alpha-methyl styrene to form cumene and pyruvic aldehyde, then

heating the resultant compounds for a period of 0.1 to about six hours under an inert gas sweep to a temperature of from about 150° C. to about 190° C. until the pyruvic aldehyde decomposes and its decomposition products are swept away in the gas sweep,

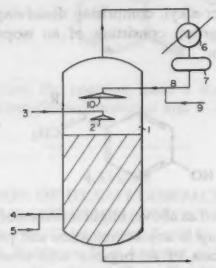
and said catalyst is selected from the group consisting of palladium, platinum, rhodium and ruthenium supported on a support selected from the group consisting of carbon, aluminum oxide and silica.

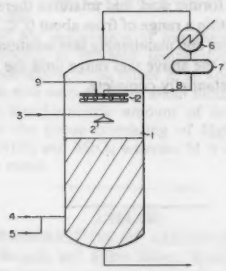
4,334,108

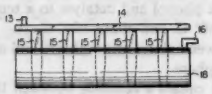
PROCESS AND APPARATUS FOR PREPARATION OF PHENOLS

Katsuhiko Hashimoto; Hirohiko Nambu, both of Iwakuni; Kazuhiro Watari, Waki; Kenichi Mizuno, Iwakuni; Tadateru Murakami, Otake; Yutaka Matsuoka, Iwakuni; Mitsutoshi Moriyama, Musashino, and Norio Ohno, Waki, all of Japan, assignors to Mitsu Petrochemical Industries Ltd., Tokyo, Japan

Filed Jun. 30, 1980, Ser. No. 164,147
Claims priority, application Japan, Jun. 30, 1979, 54-82019
Int. Cl.³ C07C 37/60
U.S. Cl. 568—803 10 Claims







1. In a process for the preparation of phenols which comprises reacting an α-hydroxyalkyl-substituted aromatic compound and/or an α,β-unsaturated alkyl-substituted aromatic compound with hydrogen peroxide in the presence of an acid catalyst, at a temperature of 20° to 100° C., the improvement wherein the hydrogen peroxide is diluted with a diluent comprising acetone so that the volume is 10 to 100 times the original volume, and the diluted hydrogen peroxide is supplied in a divided manner to at least two portions of the reaction vessel.

4,334,109

SYNTHESIS OF 4-HALOALKYL ALCOHOLS

Kenneth G. Hammond, Poughkeepsie, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 5, 1979, Ser. No. 1,241
Int. Cl.³ C07C 29/64, 31/36
U.S. Cl. 568—841 6 Claims

1. A process for synthesizing a chlorobutanol comprising reacting at a temperature of 20° to 87° C. tetrahydrofuran and hydrogen chloride in the presence of 1 to 30 parts by weight per 100 parts by weight of tetrahydrofuran of a polymeric resin which is not degraded under the reaction conditions having pendant $N(R)_3X$ or $N(R)_2$ groups where R is an alkyl group having from 1 to 10 carbon atoms and where X is chloride, bromide or iodide; said resin being insoluble in said 4-chlorobutanol.

4,334,110

METHOD OF PRODUCING SYMMETRICAL TRINITROBENZENE

Erik Bengtsson; Nils Billingsson, both of Karlskoga; Karl-Johan Persson, Storfors, and Bengt-Olov Bäckman, Karlskoga, all of Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Sep. 24, 1980, Ser. No. 190,136
Claims priority, application Sweden, Sep. 27, 1979, 7908005
Int. Cl.³ C07C 76/02, 79/10
U.S. Cl. 568—932 9 Claims

1. A method of producing 1,3,5-trinitrobenzene (symmetrical trinitrobenzene) through direct oxidation of 2,4,6-trinitrotoluene (TNT) with nitric acid (HNO_3) under pressure and at an elevated temperature above 150° C. wherein said oxidation is carried out as a continuous process by feeding 2,4,6-trinitrotoluene and a theoretical excess of nitric acid of at least 100% based on the 2,4,6-trinitrotoluene into the lower part of a vertical reaction zone containing a vertical tube with a length to diameter ratio of 100:1 to 100:2, causing the reactants to flow through said vertical reaction zone under continuous stirring achieved by gases formed during the reaction between the reactants, maintaining the pressure in said reaction zone about 15 kg/cm² by adjusting the flow speed of the reactants and product through said reaction zone; and removing reaction product from the upper part of said reaction zone.

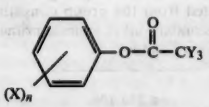
4,334,111

PROCESS FOR PREPARING SUBSTITUTED BENZOTRIHALIDES

Ralph A. Davis, and R. Garth Pews, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 17, 1978, Ser. No. 878,845
Int. Cl.³ C07C 21/24
U.S. Cl. 570—143 16 Claims

1. A process for producing a substituted benzotrihalide compound comprising pyrolyzing a substituted phenyl trihaloacetate of the formula



(I)

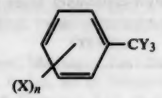
wherein each

X is halo, nitro, alkyloxy, aryloxy, aralkyloxy, cyano, lower alkyl, haloalkyl, haloalkyloxy, alkenyl, haloalkenyl, carbamoyl, N,N-dialkylcarbamoyl, N,N-diarylcarbamoyl, or N,N-diaralkyloxy;

Y is halo; and

n is an integer of from 1 to 5; to form a substituted benzotrihalide of the formula

(II)



wherein X, Y, and n are defined above.

4,334,112

PROCESS FOR PRODUCING 2,5-DICHLORO-P-XYLENE

Young-Jin Lee, South Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 5, 1978, Ser. No. 948,656
Int. Cl.[3] C07C *17/12*
U.S. Cl. 570—207 6 Claims

1. A process for producing dichlorinated p-xylene having a high ratio of 2,5-dichloro-p-xylene to 2,3-dichloro-p-xylene isomers which comprises reacting 2-chloro-p-xylene and anhydrous ferric chloride at a temperature of from 25° C. to 150° C.

4,334,113

SYNTHETIC HYDROCARBON OLIGOMERS

John P. Pellegrini, Jr., O'Hara Township, Allegheny County; David L. Beach, and Thaddeus P. Kobylinski, both of Gibsonia, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 158,482, Jun. 11, 1980, abandoned. This application Sep. 29, 1980, Ser. No. 191,867
Int. Cl.[3] C07C *5/02*
U.S. Cl. 585—18 21 Claims

1. A method for preparing a synthetic hydrocarbon fluid which comprises contacting an olefin reactant selected from 2-butene, an olefin having the formula CH_2=CH—R wherein R is alkyl having from one to about ten carbon atoms, and mixtures thereof and a catalytic amount of the reaction product of tungsten hexafluoride and water wherein tungsten hexafluoride and water are reacted in a mol ratio of between about 2:1 and about 20:1.

19. A synthetic hydrocarbon fluid comprising the hydrogenated oligomer mixture containing between about 20 and about 32 carbon atoms per molecule and prepared by the oligomerization of a 1-olefin selected from propylene, 1-butene, 2-butene, and mixtures thereof with up to about 50 mol percent of 1-olefin selected from 1-pentene, 1-hexene or a mixture thereof.

4,334,114

PRODUCTION OF AROMATIC HYDROCARBONS FROM A MIXED FEEDSTOCK OF C_5–C_{12} OLEFINS AND C_3–C_4 HYDROCARBONS

John F. G. Ellis, Northwood, England, assignor to The British Petroleum Company Limited, London, England

Filed Jul. 30, 1980, Ser. No. 173,767
Claims priority, application United Kingdom, Aug. 7, 1979, 7927534
Int. Cl.[3] C07C *15/02*
U.S. Cl. 585—407 7 Claims

1. A process for converting olefins to aromatic hydrocarbons and hydrogen which comprises bringing a mixed feedstock comprising:

(a) a hydrocarbon fraction containing olefins and consisting substantially of C_5 to C_{12} hydrocarbons derived from cracked spirits from the catalytic, thermal, or steam cracking of a crude oil fraction selected from the group consisting of distillate oils, light heavy distillate oils, atmospheric residue and vacuum residue; and

(b) saturated and/or unsaturated C_3–C_4 hydrocarbons derived from by-product gases from thermal, catalytic, or steam cracking of wax distillates, residues and deasphalted oils either before or after hydrotreating

in which the relative proportions of the hydrocarbon fraction containing olefins (a) and the C_3–C_4 hydrocarbons (b) in the mixed feedstock is between 1:3 and 3:1 by volume into contact in the vapor phase and at an elevated temperature with a catalyst composition comprising an aluminosilicate having a gallium compound deposited thereon and/or an aluminosilicate in which the cations have been exchanged with gallium ions, said aluminosilicate having a silica to alumina ratio of at least 5:1.

4,334,115

PROCESS FOR MAKING TERT-BUTYLTOLUENES

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 18, 1981, Ser. No. 274,982
Int. Cl.[3] C07C *15/395*
U.S. Cl. 585—407 6 Claims

1. A process for obtaining at least one tert-butyltoluene selected from the group consisting of 4-tert-butyltoluene and 3,5-di-tert-butyltoluene comprising reacting a hydrocarbon feed comprising isobutylene and isobutene in the liquid phase in a reaction zone in the presence of liquid hydrocarbon fluoride under conditions suitable for producing at least one of said tert-butyltoluenes, separating the acid from the hydrocarbon product, and separating at least one of said tertbutyltoluenes from the hydrocarbon product.

4,334,116

DEHYDROGENATION USING PROMOTED MOLYBDENUM-COPPER-TIN CATALYSTS

Louis J. Velenyi, Lyndhurst, and Andrew S. Krupa, Twinsburg, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 102,087, Dec. 10, 1979, Pat. No. 4,279,777. This application Apr. 27, 1981, Ser. No. 258,151
Int. Cl.[3] C07C *4/02*
U.S. Cl. 585—440 5 Claims

1. A process for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting the hydrocarbon with a catalyst of the formula:

$$Mo_aCu_bSn_cA_dL_eO_x$$

wherein

A is selected from the group consisting of Li, Na, K, Cs, Mg, Ca, Sr, Ba, La, Ce, Th, U and mixtures thereof;

L is selected from the group consisting of Zn, Cd, Hg, Al, Ga, In, Tl, Ti, Zr, Hf, Nb, Ta, Ag, Au, Te, Se, Bi, Sb, Cr, As, S, Re, Mn, Ni, Co, Ru, Rh, Pd, Os, Ir, Pt and mixtures thereof; and

wherein

a is 0.1–15;
b is 0.1–15;
c is 0.05–12;
d is 0.01–10;
e is 0–12; and
x is the number of oxygens sufficient to satisfy the valence requirements of the other elements present.

4,334,117

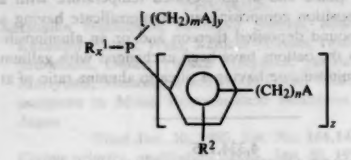
PROCESS FOR PRODUCING ALKADIENES

Noriaki Yoshimura, and Masuhiko Tamura, both of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Sep. 4, 1980, Ser. No. 183,500
Claims priority, application Japan, Sep. 10, 1979, 54-116276
Int. Cl.[3] C07C *11/12*
U.S. Cl. 585—509 7 Claims

1. A process for producing alkadienes which comprises (1) contacting butadiene or isoprene with at least one catalyst selected from the group consisting of platinum and palladium and compounds of said metals in a sulfolane solution, in the

presence of a tertiary lower alkylamine formate and at least one phosphine compound of the general formula (I)



(I)

wherein R^1 is a substituted or unsubstituted hydrocarbon group of 1 to 10 carbon atoms; R^2 is a hydrogen atom, a saturated aliphatic hydrocarbon group of 1 to 5 carbon atoms, a nitro group or a halogen atom; m is equal to 1, 2 or 3; n is equal to 0 or 1; x is equal to 0, 1 or 2; y and z each is 0, 1, 2 or 3 (provided that y and z are not concurrently equal to 0 and that $x+y+z=3$); A is $-SO_3M$ wherein M is a cation selected from the group consisting of H, alkali metals, alkaline earth metals and NH_4 or the formate or an inorganic acid salt of

wherein R^3 and R^4 each is a saturated aliphatic hydrocarbon group of 1 to 4 carbon atoms, in an amount of 4 to 200 moles per gram atom of the metal constituting the catalyst to form dimeric alkadienes; (2) separating the reaction mixture into an alkadiene-containing layer and a catalyst-containing layer; and (3) recycling said catalyst-containing layer to the alkadiene production process.

4,334,118

SOLID PHOSPHORIC ACID CATALYZED OLEFIN POLYMERIZATION PROCESS

John F. Manning, Moraga, Calif., assignor to Chevron Research, San Francisco, Calif.

Filed Jun. 1, 1981, Ser. No. 268,943

Int. Cl.³ C07C 2/04

U.S. Cl. 585—529 **9 Claims**

1. In a process for polymerizing C_3–C_{12} olefins to produce lower polyolefins which comprises contacting a mixed liquid/-vapor olefin feed stream with a solid phosphoric acid catalyst having a siliceous support under polymerization conditions, the improvement wherein said catalyst has a phosporic acid strength in the range of about from 100 to 108 wt. %, and said olefin feed stream comprises an amount of an alkanol, selected from the group consisting of alkanols which are reactive at the polymerization conditions used for said process to decompose at yields of at least 50% upon contact with said solid phosphoric acid catalyst under said polymerization conditions generating water as a decomposition product, effective to maintain the phosphoric acid strength of said catalyst within said range by replacing at least a portion of the water discharged from said catalyst during said polymerization with water generated by decomposition of said alkanol.

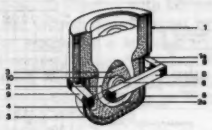
4,334,119
CHANNEL FURNACE HAVING A MAGNETIC CORE FOR GENERATING THREE-DIMENSIONAL MAGNETIC FIELDS

Heinz Baltensperger, Mellingen; Karl Buhler, Nussbaumen, and Werner Schott, Baden, all of Switzerland, assignors to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Continuation-in-part of Ser. No. 78,688, Sep. 25, 1979. This application Jan. 30, 1981, Ser. No. 229,941

Int. Cl.³ H05B *5/14*

U.S. Cl. 373—159 **2 Claims**



1. A channel furnace for metals, comprising:

a melting tank;

a duct forming a loop below said tank, said duct having an inner channel connected to two different zones in the bottom of said tank; and

an inductor disposed within said loop for producing a three-dimensional magnetic field to heat and circulate metal in said channel, said inductor including:

a magnetic core having an inner core formed from a plurality of disk-shaped sheets stacked upon one another to form a substantially cylindrical core and an outer core surrounding said inner core formed from a plurality of elongated sheets extending in the longitudinal direction of the core, each elongated sheet being generally radially oriented, and

a coil surrounding said magnetic core.

4,334,120
SUNLIGHT-INTO-ENERGY CONVERSION APPARATUS

Masaru Yamano, Hirakata, and Yukinori Kuwano, Takatsuki, both of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Mar. 12, 1980, Ser. No. 129,716

Claims priority, application Japan, Mar. 20, 1979, 54-32814; Feb. 13, 1980, 55-16901

Int. Cl.³ H01L *31/04;* **F24J** *3/02*

U.S. Cl. 136—248 **13 Claims**

1. A sunlight-into-energy conversion apparatus, comprising:

a heating medium tube;

a heat collecting element thermally connected to the heating medium tube and having a surface; and

at least one amorphous silicon solar cell located on said surface and having a thickness such that the infra-red portion of sunlight incident upon said at least one solar cell will pass therethrough and will heat the heat collecting element.

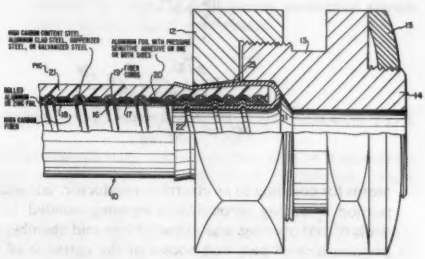
4,334,121
ELECTRICAL CONDUIT INCLUDING HELICAL GROUNDING AND REINFORCING ELEMENTS

Thomas A. Kutnyak, Greenwood, S.C., assignor to Automation Industries, Inc., Greenwich, Conn.

Filed May 15, 1980, Ser. No. 150,212

Int. Cl.³ H02G *3/04;* **F16L** *11/10, 11/12*

U.S. Cl. 174—68 C **23 Claims**



16. An electrical conduit comprising

(a) a self-supporting helix;

(b) a foil channel applied helically about the helix and spanning the turns thereof, the edges of the channel being spaced apart over the turns of the helix;

(c) an electrically conductive grounding element applied helically about the channel; and

(d) an outer circumferentially complete jacket.

19. An electrical conduit and end fitting assembly comprising

(a) an electrical conduit comprising

i. a self-supporting helix;

ii. a foil channel applied helically about the helix and spanning the turns thereof, the edges of the channel being spaced apart over the turns of the helix;

iii. an electrically conductive grounding element applied helically about the channel; and

iv. an outer circumferentially complete jacket; and

(b) an end fitting comprising

i. a cylindrical insert forcibly screwed into an end portion of the conduit;

ii. the insert having a helical exterior land of a pitch equal to that of the self-supporting helix;

iii. the helical land deforming the center of the channel outwardly.

4,334,122
BIMETALLIC ELECTRICAL CONNECTOR AND METHOD FOR MAKING SUCH CONNECTOR

Moreland P. Bennett, Hickory, N.C., assignor to General Electric Company, Philadelphia, Pa.

Filed Jun. 25, 1980, Ser. No. 163,007

Int. Cl.³ H01R *4/02*

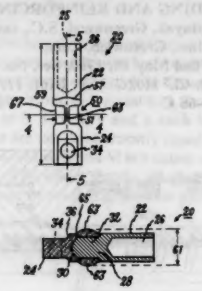
U.S. Cl. 174—94 R **4 Claims**

1. An electrical terminator comprising:

a first member of a copper material having a first end portion, a cylindrical middle portion, a cylindrical second end portion and an opening extending from said cylindrical second portion to said cylindrical middle portion, said first end portion having means for coupling to an electrical conductor, said cylindrical middle portion having a circumferential depression in its major portion and two radi-

ally-outwardly projecting lips at diametrically opposite locations extending longitudinally of said middle portion, said opening having a chamber at its inner end with a circumferentially extending pocket located at the entrance to said chamber, the pocket projecting radially outwardly from the adjacent portion of said opening, and;

a second member of an aluminum material having a first end portion and a second portion, said first end portion having



means for coupling to an electrical conductor, said second portion extending through said opening bonded to the walls of said opening, and extruded into said chamber to a position located past said pocket at the entrance of said chamber and having a portion filling said pocket;

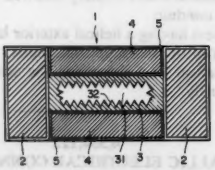
said circumferential depression having lips and said extrusion of the aluminum second portion forming an interlocking joint of said second member within said first member.

4,334,123

INTERNAL COOLING TYPE SUPERCONDUCTOR

Naofumi Tada, Hitachi; Hiroshi Kimura, Tokyo, and Hisanao Ogata, Shimoinayoshi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 14, 1980, Ser. No. 206,728
Claims priority, application Japan, Nov. 16, 1979, 54-147790
Int. Cl.³ H01B *12/00*
U.S. Cl. 174—15 S **9 Claims**



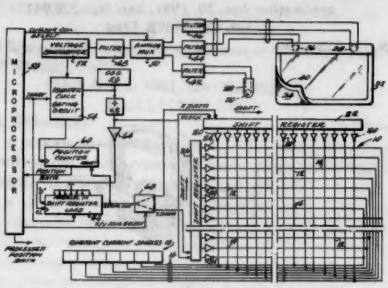
1. An internal cooling type superconductor having at least one wire of superconductive material throughout its length, a stabilizer joined to the superconductive material, a coolant passage formed in the stabilizer and extending in the length direction of said superconductor forming means to pass a coolant fluid and cool said superconductor and helium within said passage, the improvement being in that a ratio of a total circumferential length of said coolant passage contacting with supercritical helium as a coolant to a total sectional area of said coolant passage is greater than 25 (cm^{-1}), and that the total sectional area of said coolant passage is at least 4 percent of the total sectional area of said superconductor.

4,334,124

FLOATING COORDINATE SYSTEM

Bruce E. Imsand, and Robert L. Kuehlthau, both of Huntsville, Ala., assignors to Intergraph Corporation, Huntsville, Ala.

Filed Mar. 26, 1980, Ser. No. 134,345
Int. Cl.³ G08C *21/00*
U.S. Cl. 178—19 **25 Claims**



1. A method for determining the position of a device with respect to a first coordinate system and a second coordinate system in a computer coordinate entry system comprising the steps of:

producing data related to the position of said device with respect to said first coordinate system;

producing data related to the position of said second coordinate system with respect to said first coordinate system; and

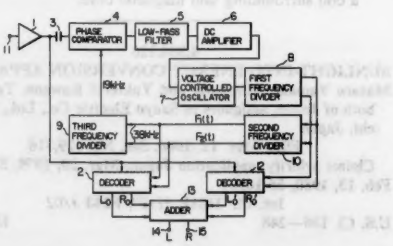
generating from said device positional data and said second coordinate system positional data a signal related to the position of said device with respect to said second coordinate system.

4,334,125

STEREO DEMODULATOR CIRCUIT

Shigeki Inoue, Toyokawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 6, 1980, Ser. No. 118,974
Claims priority, application Japan, Feb. 13, 1979, 54/14230
Int. Cl.³ H04H *5/00*
U.S. Cl. 179—1 GE **4 Claims**



1. A stereo demodulator circuit comprising:

a voltage-controlled oscillator for generating a signal having a frequency which is N times (N being an integer not less than 3) the frequency of a sub-carrier in synchronism with the phase of a pilot signal contained in a composite signal;

a first frequency divider supplied with an output signal from said voltage-controlled oscillator and dividing by N the frequency of the output signal from said voltage-controlled oscillator for producing a first switching signal having the same frequency as said sub-carrier frequency;

a second frequency divider supplied with an output signal from said voltage-controlled oscillator and dividing the

frequency of the output signal from said voltage-controlled oscillator for producing a second switching signal having a frequency which is 3 times the frequency of said sub-carrier;

a first circuit means supplied with said composite signal for producing a first output signal;

a second circuit means supplied with said composite signal for producing a second output signal which is one-third the amplitude of the first output signal from said first circuit means;

a first switching circuit supplied with said first switching signal and the first output signal of said first circuit means for separating a left and a right channel signal from said composite signal;

a second switching circuit supplied with said second switching signal and the second output signal of said second circuit means for separating a left and a right channel signal from said composite signal;

a first adder for adding the left channel output signal of said first switching circuit to the left channel output signal of said second switching circuit; and

a second adder for adding the right channel output signal of said first switching circuit to the right channel output signal of said second switching circuit.

4,334,126

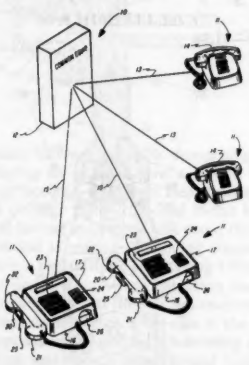
CONTROL CIRCUIT FOR CONCURRENTLY MONITORING AND CONTROLLING FUNCTIONS AND FREQUENCY MODULATING STATUS INFORMATION IN A DIGITAL DATA NETWORK

Barry Slingsby, Altomante Springs, Fla., assignor to Stromberg-Carlson Corporation, Orlando, Fla.

Filed Feb. 11, 1980, Ser. No. 120,570

Int. Cl.³ H04Q *5/18*

U.S. Cl. 179—18 ES **11 Claims**



1. A remote unit for performing various control functions and monitoring other functions in response to frequency modulated control data signals conveyed from a central location over a data signal path means, said unit comprising:

A. at least one first function means for performing a predetermined control function in response to the control data signal from the central location, each said first function means responding to the control data when it is constituted by electrical logic signals,

B. at least one second function means for generating electrical logic signals corresponding to control data to be transferred to the central location,

C. decoding means for converting the frequency modulated control data signals into electrical logical signals, and

D. control means interconnecting each said function means and said decoding means, said control means including:

i. a voltage source for generating a voltage,

ii. switching means connected to said voltage source for selectively switching a voltage onto the data signal path means, and

iii. a programmed microcomputer system means including:

(a) a plurality of output signalling means connected to said first function means and to said switching means, and

(b) a plurality of input signalling means connected to said second function means and said decoding means, said microcomputer system means generating, in response to its program, on said output signalling means connected to said switching means a frequency modulated control signal in response to signals at said input signalling means, said switching means being shifted between conductive and nonconductive states in response to the frequency modulated control signal thereby to couple the frequency modulated signals onto the data signal path means.

4,334,127

MAGNETIC CIRCUIT FOR PLANAR DIAPHRAGM TYPE LOUDSPEAKER

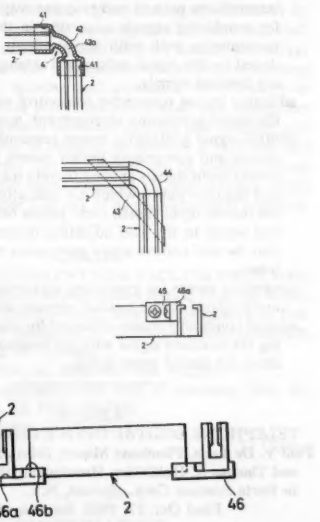
Kunihiko Shimada, and Yukio Tsuchiya, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 30, 1980, Ser. No. 164,128

Claims priority, application Japan, Jun. 30, 1979, 54-82956; Jun. 30, 1979, 54-82957; Jun. 30, 1979, 54-90270[U]; Jun. 30, 1979, 54-90275[U]

Int. Cl.³ H04R *9/02*

U.S. Cl. 179—115.5 R **12 Claims**



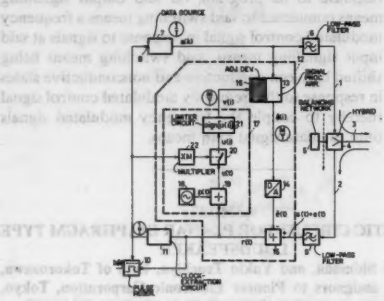
1. A magnetic circuit comprising: a plurality of straight magnetic circuit units of a predetermined length, said magnetic circuit units being arranged in a polygon; and means for mechanically and magnetically coupling said magnetic circuit units at ends thereof,

said means for mechanically and magnetically coupling said magnetic circuit units comprising an elbow section of magnetic metal, said elbow section having insert recess portions at both ends thereof and a curved coupling portion therebetween, said insert recess portions being adapted to receive ends of said magnetic circuit units.

4,334,128
ECHO CANCELER FOR HOMOCHRONOUS DATA TRANSMISSION SYSTEMS

Wilfred A. M. Snijders, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 10, 1980, Ser. No. 128,418
Claims priority, application Netherlands, Mar. 15, 1979, 7902053
Int. Cl.³ H04B 3/20
U.S. Cl. 179—170.2 1 Claim



1. An echo canceller including:

an adjustable signal processing arrangement connected to a first one-way transmission path out of two one-way transmission paths of a transmission system for producing a synthetic echo signal;

first combining means connected to the second one-way transmission path of said two one-way transmission paths for combining signals occurring in the second one-way transmission path with the synthetic echo signals produced by the signal processing arrangement for generating residual signals;

adjusting means responsive to control signals for adjusting the signal processing arrangement; and

control signal generating means responsive to said residual signals and comprising limiter means for converting the limiter input signals applied thereto into a train of positive and negative pulses which are indicative of the polarity of the limiter input signal, these pulses being applied as control signal to the said adjusting means, characterized in that the said control signal generating means further comprise:

generating means for generating an auxiliary signal which is uncorrelated to the residual signals; and

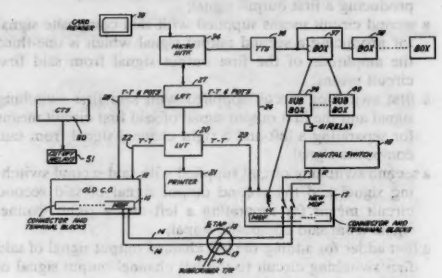
second combining means arranged for algebraically combining the auxiliary signal with the residual signals for generating the limiter input signal.

4,334,129
TELEPHONE DIGITAL OFFICE CUTOVER SYSTEM

Paul V. De Luca, Plandome Manor; John J. Gazzo, Commack, and Thomas A. Hollfelder, Huntington, all of N.Y., assignors to Porta Systems Corp., Syosset, N.Y.

Filed Oct. 17, 1980, Ser. No. 197,911
Int. Cl.³ H04M 3/30
U.S. Cl. 179—175.11 2 Claims

1. A system for automated testing of telephone subscriber pairs prior to cutover from an old telephone office frame to a new digital control office frame comprising: a plurality of serially readable cards each having coded information relative to a subscriber pair, including old and new directory numbers; card reading means for serially reading said cards; a computer means interfacing with said card reader; a line verification tester interfacing with said computer means and having test trunks interconnecting the subscriber pairs in said old and new offices; signal means sensing the output of said line verification tester; half tap means interconnecting each of said subscriber pairs to said old and new offices; said old office having cut off relays corresponding to each subscriber pair, and a manually controlled cut through system controlling said cut off relays;

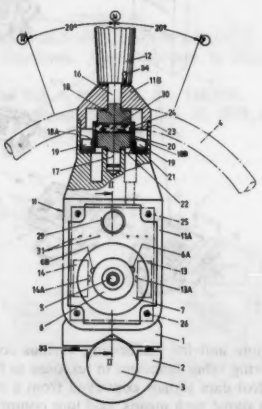


said new office having a digital switching system, and relays for interconnecting said switching system to individual subscriber pairs; and a trunk transition system interfaced with said computer means, and controlling said relays at said new office.

4,334,130
GEAR SHIFTER MOUNTED ON STEERING COLUMN OF HEAVY-DUTY VEHICLE

Willy Beig, Friedrichshafen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, Friedrichshafen, Fed. Rep. of Germany

Filed Aug. 22, 1980, Ser. No. 180,348
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1979, 2934473
Int. Cl.³ H01H 9/06
U.S. Cl. 200—61.54 7 Claims



1. A gear shifter for an automotive vehicle provided with a steering column and further provided with a gear transmission including electrical control means responsive to first and second command signals for establishing forward and reverse drive, respectively, and to a plurality of additional command signals for establishing as many different speed ratios in either driving direction,

comprising:

a mounting member fixedly securable to said steering column and provided with a pivot stud orientable substantially parallel to said column;

a hollow shift lever swingable on said pivot stud between

three pivotal positions including a forward position, a reverse position and an intermediate neutral position;

a first pair of coacting detent members on said pivot stud and in the interior of said shift lever for releasably indexing the latter in any of said pivotal positions;

a knob rotatably mounted on an extremity of said shift lever remote from said pivot stud, said knob having a stem extending into said extremity;

a second pair of coacting detent members on said stem and in said extremity for releasably indexing said knob in any of a plurality of angular positions relative to said shift lever;

first cam means on said pivot stud;

a first and a second microswitch inside said shift lever positioned for operation by said first cam means in said forward position and in said reverse position for emitting said first and said second command signal, respectively;

second cam means on said stem;

a plurality of further microswitches in said extremity positioned for operation by said second cam means in respective angular positions of said knob for emitting said additional command signals; and

conductor means extending from said shift lever for carrying said command signals to said control means.

4,334,131

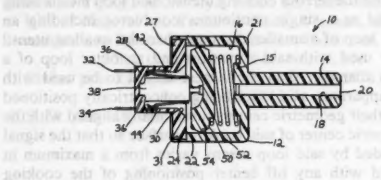
MULTI-STAGE PRESSURE SWITCH

Steven R. Cooper, Elkhart, Ind., and Kenneth L. Shaw, Edwardsburg, Mich., assignors to CTS Corporation, Elkhart, Ind.

Filed Jul. 18, 1980, Ser. No. 172,361

Int. Cl.³ H01H *35/38*

U.S. Cl. 200—82 R **15 Claims**



1. A fluid pressure differential switch, comprising an annular cover housing having an internal bore, a switch housing secured to the cover housing, a resilient means disposed in said cover housing, a circular piston disposed in the bore of said cover housing and having an integral seal about the circumference of the piston and in sealing and sliding contact with the surface of said bore, a switch drive arm having a first contactor mounted thereon and a switch arm extension and ball, said piston having a socket disposed therein and receiving said ball to universally connect the switch drive arm to the piston, and first terminals disposed inside said switch housing and extending outwardly from said switch housing, said resilient means biasing said piston in response to changes in fluid pressure differential effecting movements of said piston along said bore whereby said contactor engages and disengages from said first terminals.

4,334,132

SWITCH WITH SHAFT POSITIONING ARRANGEMENT

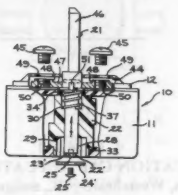
William F. Poole, Jeffersontown, Ky., assignor to General Electric Company, Louisville, Ky.

Continuation of Ser. No. 1,630, Jan. 8, 1979, abandoned. This application Aug. 15, 1980, Ser. No. 178,268

Int. Cl.³ H01H *19/58*

U.S. Cl. 200—153 LB **4 Claims**

1. A switch having a housing provided with a rotatable actuator, a set of contacts operable between open and closed positions by said actuator and a rotatable selector shaft for positioning said actuator in response to the rotational position of said shaft; said shaft extending out of the front of said housing and extending through said actuator to the rear of said housing adjacent a rear opening in said housing; a mounting member positioned in said housing; said mounting member and said housing having cooperating positioning means for selectively locating said mounting member in one of a plurality of predetermined positions spaced angularly around said shaft; said mounting member including first latching means having a different predetermined position relative to said shaft when said mounting member is in each of its plurality of positions; second latching means carried by said shaft and adapted to engage said first latching means when said shaft is in a first position to prevent rotation of said shaft until said shaft is moved axially toward the rear of said housing for disengaging said first and second latching means; removable securing means for securing said mounting member in any of its predetermined positions within said housing; axial movement of said



shaft toward the rear of said housing, with said securing means removed, freeing said mounting member for movement from one to another of its predetermined positions so that the position of the first latching means and thus the first position of said shaft is moved; an actuator driver carried by said shaft adjacent the rear of said housing and operatively interconnected to said actuator to drive said actuator upon rotation of said driver by said shaft; coupling means for coupling said driver to said shaft and fastener means carried by said shaft for locking said driver to said shaft; said fastener being located adjacent said opening in the rear of said housing and accessible therethrough to permit removal of said driver from said shaft and subsequent relocking of said driver to said shaft through said opening; said coupling means being so oriented in relation to said first and second latching means that said driver can be coupled to said shaft and operatively interconnected to said actuator when said mounting member is in any of its predetermined positions.

4,334,133

CONTACT ARRANGEMENT FOR VACUUM SWITCHES

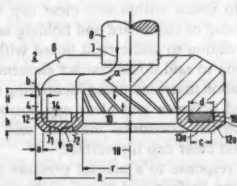
Rudolf Gebel, Erlangen; Gerhard Peche, Berlin; Heinrich Schindler, and Jürgen-Dietrich Welly, both of Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 24, 1980, Ser. No. 132,865

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1979, 2912823; Nov. 26, 1979, 2947562

Int. Cl.³ H01H *1/06*

U.S. Cl. 200—279 **22 Claims**



1. In a contact arrangement for vacuum switches with cup contacts which are arranged coaxially to each other, each comprising a slotted contact carrier which is provided with a

closed contact ring, the end face of which forms a contact surface, the improvement comprising:

(a) bevels formed on the exposed surface of the contact ring extending radially inward and outward leaving an annular flat portion of reduced width on the face of the contact ring to form the contact surface, and;

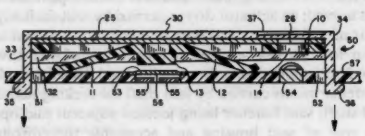
(b) an annular zone of substantially reduced conductivity as compared to the material of the contact carrier between the contact ring and the contact carrier in an area which is adjacent the annular flat portion of said contact surface whereby current will flow from said contact carrier, through the portion of said contact ring containing said bevels to said flat contact surface to result in magnetic forces which tend to stabilize the arc.

4,334,134

IDENTIFICATION CAP ACTUATOR ASSEMBLY

George M. Janda, Westchester, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Nov. 13, 1980, Ser. No. 206,493
Int. Cl.³ H01H 9/06
U.S. Cl. 200—314 **5 Claims**



1. An identification cap actuator adapted to cooperate with circuit closing a means, said circuit closing means including a circuit board having conductors thereon, a resilient dome contact element in spaced apart relationship to said conductors and adapted to make contact with said conductors upon the application of a force thereon, said circuit board further including a pair of slots extending through said circuit board each on an opposite side of said dome contact element, said identification cap actuator comprising:

a clear cap having top and bottom surfaces and at least two walls extending perpendicularly to said top and bottom surfaces, each of said walls including leg portions extending beyond said respective wall and each leg portion inserted into a different one of said circuit board slots;

a tension bar including a horizontally oriented member, a pair of arms each arm extending obliquely from said horizontal member and in opposite directions from each other and a finger located between said arms, said tension bar arranged to install within said clear cap with said arms resting on said circuit board and holding said clear cap in a spaced relation to said circuit board with said finger in juxtaposition to said dome contact element; and

an indentification insert including identifying indicia thereon sandwiched between said clear cap bottom surface and said tension bar horizontal member, said indicia visible through said clear cap top surface;

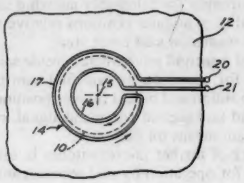
whereby, in response to a manual pressure applied to said clear cap top surface said clear cap legs extend through said respective slots and said tension bar is urged downward allowing said tension bar finger to apply said pressure to said dome contact element allowing said dome contact element to contact said conductors.

4,334,135

UTENSIL LOCATION SENSOR FOR INDUCTION SURFACE UNITS

Peter H. Smith, Anchorage, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 22, 1980, Ser. No. 218,875
Int. Cl.³ H05B 6/12
U.S. Cl. 219—10.49 R **4 Claims**



1. An induction cooking apparatus comprising:

a cooking surface for supporting a ferrous cooking utensil, said cooking surface having a geometric center;

an induction heating coil positioned below said surface for producing an ultrasonic magnetic field linking the ferrous utensil for heating the contents of the utensil, said heating coil having a geometric center aligned with the geometric center of said cooking surface;

conductive loop means located in a plane substantially parallel to said cooking surface intermediate said cooking surface and said induction coil for providing a signal responsive to the magnetic field between said induction heating coil and the ferrous cooking utensil; said loop means being formed as a single continuous conductor including an inner loop of a smaller diameter than the smallest utensil to be used with said apparatus and an outer loop of a larger diameter than the largest utensil to be used with said apparatus, said loops being concentrically positioned with their geometric centers substantially aligned with the geometric center of said cooking surface so that the signal provided by said loop means varies from a maximum in accord with any off center positioning of the cooking utensil on said cooking surface.

4,334,136

MICROWAVE TREATING MECHANISM

Douglas P. Mahan, 1510 NE. 72nd Ave., Portland, Oreg. 97213; Richard E. Skinner, and Robert A. McClanathan, both of Portland, Oreg., assignors to Douglas P. Mahan, Portland, Oreg.

Filed Oct. 1, 1979, Ser. No. 80,665
Int. Cl.³ H05B 6/68; F26B 11/02
U.S. Cl. 219—10.55 B **7 Claims**

1. Microwave treating mechanism for removing moisture from articles comprising

(a) a hollow tumbler-type drum arranged to receive articles from which moisture is to be removed,

(b) support means supporting said drum on substantially a horizontal axis,

(c) drive means arranged to rotate said drum whereby articles being treated tumble across the interior of said drum,

(d) microwave power means on said support means disposed with the output thereof directed in an axial direction into said drum for engaging articles tumbling across the rotating drum for removing moisture therefrom,

(e) an electric circuit for said power means,

(f) control means in said circuit for said power means,

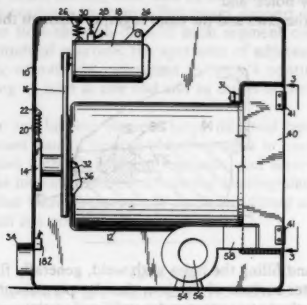
(g) and forced air means in said mechanism moving heated air through said drum for carrying away moisture within said drum,

(h) said forced air means including air inlets into said support means and drum,

(i) an air outlet from said drum,

(j) and a passageway between said inlet and outlet

(k) said passageway extending adjacent to said power means in an arrangement such that forced air that removes moisture from said drum cools said power means and said power means in being cooled causes said forced air to be heated before its entry into said drum to increase the vapor carrying capabilities of said forced air.



4,334,137

ARRANGEMENT FOR COOKING EITHER WITH A HEAT SOURCE OR A MICROWAVE SOURCE

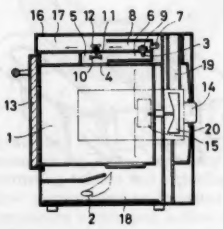
Hidehiko Takagi, Ichinomiya; Hisao Hayashi; Kazuo Ogawa, both of Nagoya, and Yoshihiro Kanaya, Konan, all of Japan, assignors to Rinnai Kabushiki Kaisha, Fukuzumi, Japan

Filed Oct. 18, 1979, Ser. No. 86,066

Claims priority, application Japan, Oct. 25, 1978, 53-145776

Int. Cl.³ H05B *6/74*

U.S. Cl. 219—10.55 F **5 Claims**



1. An apparatus for cooking either with a heat source or a microwave source, comprising: a heating chamber provided with a heat source; a stirrer chamber on an outer side of said heating chamber; a partition plate air-tightly separating the heating chamber from the stirrer chamber; a waveguide in communication with said stirrer chamber and extending sidewards therefrom; a magnetron having an output connected to the waveguide, whereby cooking by heat from the heat source and cooking by microwave with the magnetron can be carried out as selected; a ventilation duct on the outer side of said stirrer chamber and said waveguide; a cooling fan in communication with said ventilation duct; said ventilation duct having upstream and downstream sides; a radiation fin on said magnetron and disposed in the upstream side of said ventilation duct; a windmill on the downstream side of said ventilation duct; a stirrer in said stirrer chamber; a shaft connecting said stirrer to said windmill; and said stirrer chamber and said ventilation duct being partitioned air-tightly to prevent microwave leakage.

4,334,138

METHOD OF ELECTRIC WELDING TINFREE CANS

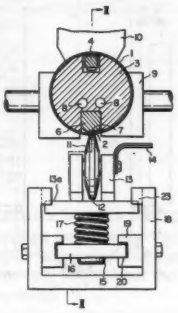
Kenji Matsuno, Yokohama, and Hiroyuki Funamoto, Tokyo, both of Japan, assignors to Toyo Seikan Kaisha, Limited, Tokyo, Japan

Filed May 19, 1980, Ser. No. 150,775

Claims priority, application Japan, Aug. 6, 1979, 54-99479; Aug. 23, 1979, 54-106696

Int. Cl.³ B23K *11/06*

U.S. Cl. 219—64 **7 Claims**



1. A method of making a tinfree steel can body having a mash welded side seam from a blank of a tinfree steel, said tinfree steel having a surface chromium layer consisting of a metallic chromium layer of 20~200 mg/m^2 and a chromium oxide layer thereon of 5~30 mg/m^2 in terms of chromium which comprises

preparing a can body preform having a side lapped portion, formed from the blank of said tinfree steel whose opposite marginal portions to be overlapped remain as they are without removing said surface chromium layer, said lapped portion being formed by overlapping said marginal portions, so that the width of said lapped portion is 0.2–1.2 mm;

providing a cooled elongated electrode having an electrode surface the width of which is greater than that of said lapped portion, and a cooled rotary electrode opposite to said elongated electrode and having an electrode surface the width of which is greater than that of said lapped portion, and a radius of curvature of at least 50 mm;

placing said can body preform such that the inner side of said lapped portion is opposed to said electrode surface of said elongated electrode;

moving said rotary electrode in the direction of said lapped portion while pressing the whole width of said lapped portion between said electrode surfaces of said elongated electrode and said rotary electrode with a welding force of 40 to 500 kg and satisfying the relationship of $1/1000 \leqq L/W \leqq 1/00$, wherein L is the width of said lapped portion in mm and W is the welding force in kg; and

simultaneously, applying an A.C. current between said elongated electrode and said rotary electrode, and seam resistant welding said lapped portion, so as to form a mash welded side seam whose thickness is 1.0 to 1.6 times as large as the thickness of the blank of said tinfree steel, at least the portion of the inner surface of said side seam which was brought into contact with said elongated electrode being covered with said surface chromium layer.

4,334,139

APPARATUS FOR WRITING PATTERNS IN A LAYER ON A SUBSTRATE BY MEANS OF A BEAM OF ELECTRICALLY CHARGED PARTICLES

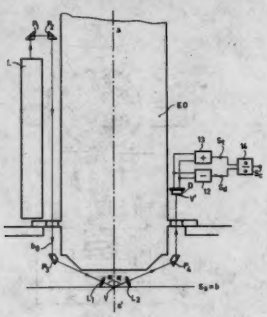
Stefan Wittekoek, and Theodorus A. Fahner, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 9, 1980, Ser. No. 157,993

Claims priority, application Netherlands, Jun. 12, 1979, 7904580

Int. Cl.³ B23K *15/00*

U.S. Cl. 219—121 EW 7 Claims



1. An apparatus for writing patterns in a layer of a substrate by means of a charged particle beam, said apparatus comprising:

a. a source for producing a charged particle beam along a beam axis;

b. means for moving the substrate relative to the beam axis;

c. an electrical lense for focusing the charged particle beam onto the layer;

d. deflection means for deflecting the charged particle beam to predetermined positions on the substrate;

e. an optical system including:

1. a radiation source for producing an optical beam;

2. first optical means for focusing the optical beam into a spot on the surface of the substrate; and

3. second optical means for forming an image of the spot in a plane of the optical system; and

f. detection means for detecting the position in said plane at which the image is formed, and for producing a signal representative of a lateral positional error of the image caused by a deviation between the actual and a desired distance of the deflection means from the substrate surface, said signal being utilizable by the deflection means for automatically adjusting the deflection angle of the charged particle beam to prevent lateral positional errors of said charged particle beam.

4,334,140

PIPE CLAMP WITH IMPROVED BAND CONNECTION

James C. Morriss, Jr., Nash, Tex., assignor to JCM Industries, Inc., Nash, Tex.

Continuation of Ser. No. 786,456, Apr. 11, 1977, abandoned. This application Apr. 27, 1979, Ser. No. 33,910

Int. Cl.³ B23K *9/225;* B65D *63/02*

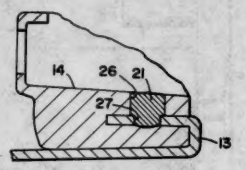
U.S. Cl. 219—127 4 Claims

1. In the production of a low-bolt pipe clamp of the type having a malleable band secured to cast metal lugs, which in service are drawn together by bolts to seal together two sections of pipe, a method for securing the malleable band to each cast metal lug to produce a high-strength, shear resistant connection, comprising the steps of:

providing an integrally formed cast lug with open jaws across its width, spaced apart sufficiently to receive the end of the band between them, with holes through at least one jaw, spaced across its width;

inserting the band into the cast lug between the open jaws, with spaced holes in the band end aligned in registry with the jaw holes; and

welding the jaws and the band together through the aligned



holes and filling the holes with weld, generally flush with the outer surface of the jaw, thereby permanently maintaining the jaw spacing and providing locations where the two jaws and the band are securely welded together.

4. A low-bolt pipe clamp of the type having a non-cast malleable band secured to a pair of cast metal lugs, said pipe clamp being formed according to the method of claim 1.

4,334,141

COMBINED ELECTRIC WATER HEATING AND VESSEL SUPPORT PLATE FOR A BEVERAGE PREPARATION DEVICE

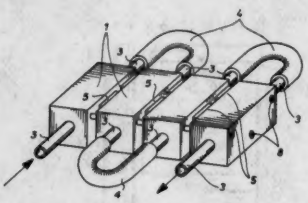
Hanno Roller; Helmut Ohnmacht, both of Kandel; Ludwig Lieber, Steinweiler, and Karl-Heinz Nauerth, Erlenbach, all of Fed. Rep. of Germany, assignors to Firma Fritz Eichenauer, Kandel, Fed. Rep. of Germany

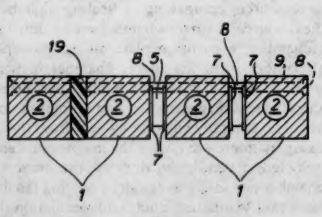
Filed Jan. 16, 1979, Ser. No. 3,896

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1978, 2804818

Int. Cl.³ A47J *31/44;* F24H *1/12;* H05B *3/00*

U.S. Cl. 219—283 12 Claims





1. In a beverage preparation device for a vessel,

a combined water heating and vessel support plate member for supporting the vessel for the device, said plate member comprising

a heating slab including a freely selectable number of heating-plate segments of good heat conductivity and plate-

like electric heating elements of positive temperature coefficient electrical resistance, wherein:

the heating-plate segments each being provided with a water flow-through duct, means for clamping adjacent heating-plate segments together side-by-side with their top surfaces coplanar to form a flat vessel support surface, the water flow-through duct of each segment comprising a longitudinal aperture, the apertures of adjacent segments being operatively connected to form a continuous duct having an inlet at one end and an outlet at the other end, and

at least one heating element being disposed between each adjacent pair of heating-plate segments in heat exchange contact with the adjacent segments, and wherein

any free intermediate space between heating-plate segments is filled with an electrically insulating, filling composition which is a good conductor of heat.

4,334,142

SKIN EFFECT PIPE HEATING SYSTEM UTILIZING CONVECTIVE AND CONDUCTIVE HEAT TRANSFER

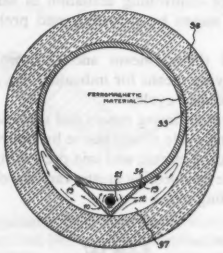
Douglas Blackmore, 57 Hillcrest Dr., Upper Saddle River, N.J. 07458

Continuation-in-part of Ser. No. 1,044, Jan. 4, 1979, Pat. No. 4,280,045, which is a continuation-in-part of Ser. No. 744,437, May 6, 1977, abandoned. This application Aug. 20, 1980, Ser. No. 179,719

The portion of the term of this patent subsequent to Jul. 21, 1998, has been disclaimed.

Int. Cl.[3] H05B *3/00*; F16L *53/00*

U.S. Cl. 219—301 **4 Claims**



1. A heat generating system for mounting on the wall of a pipe, said system having a heat generator structure utilizing skin effect alternating current and including a ferromagnetic, elongate hollow element and an insulated conductor freely movable for expansion within said hollow element, the inner surfaces of said element defining an air space at least partially surrounding said conductor, said conductor being connected at one end to one pole of a source of alternating current, the other end of the conductor being connected to a far end of said hollow element, and a near end of the hollow element being connected to another pole of the alternating current source, said hollow element comprising two parts with one part defining an elongated open face channel having two elongated, coextensive, spaced longitudinal edges, the other part being the portion of the wall of said pipe confronting said one part and bounded by said longitudinal edges, means securing said other part in spaced relationship to said longitudinal edges so as to provide openings between said other part and said longitudinal edges of said one part along the length of said hollow element for enabling substantial transverse air flow freely therethrough across said conductor and internal surfaces of said hollow element with resultant convection heating air flow of said generated heat, and said two parts being of such thickness that said alternating current is confined along the inner surface portion of said hollow element when said conductor and hollow element are energized by said source.

4,334,143

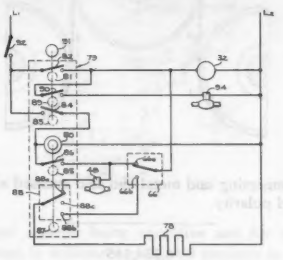
HEATER PROTECTION ARRANGEMENT FOR A WASHING APPLIANCE

Donald S. Cushing, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Oct. 11, 1979, Ser. No. 83,912

Int. Cl.[3] H05B *1/02*

U.S. Cl. 219—333 **6 Claims**



1. In a washing appliance having a wash chamber, fill means for controllably supplying liquid to the wash chamber, heater means for heating liquid in the wash chamber, and drain means for controllably removing liquid from the wash chamber; a control system comprising:

level sensing means for sensing the liquid level in the wash chamber, said sensing means being constructed and arranged to assume a reset state when there is less than a predetermined level of liquid in said wash chamber;

sequence control means comprising a timer motor for controlling the fill means and the drain means to provide a plurality of operating cycles including a drain cycle during which liquid is removed from the wash chamber;

a first cam-actuated switch operative, when actuated by said timer motor, to enable energization of said timer motor independent of the liquid level in the wash chamber; and

a second, cam-actuated switch connected in circuit between said level sensing means and said timer motor and operative, when actuated by said timer motor, to enable energization of said timer motor when said level sensing means is in its reset state, said first and second cam-actuated switches being so connected to said timer motor that at the end of a drain cycle said timer motor first actuates said second switch and deactuates said first switch, thereby preventing continued energization of said timer motor unless said level sensing means is in its reset state at the end of the drain cycle.

4,334,144

CORONA EFFECT SURFACE TREATMENT APPARATUS FOR SHEET

Ezio Ferrarini, Via Melotta, 19, Soncino, Cremona, Italy

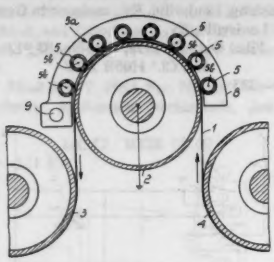
Filed Apr. 7, 1980, Ser. No. 137,931

Int. Cl.[3] H05B *7/18*

U.S. Cl. 219—383 **3 Claims**

1. An apparatus for corona effect surface treatment of sheet materials, comprising an elongated metal electrode and at least one insulating material encased electrode coextensive therewith and spaced therefrom to form a gap therebetween through which the materials to be treated are caused to pass and, supporting means for the electrodes, wherein according to the improvement, said encased electrode comprises a tube of insulating material defining a hollow tubular inner space therein, a conductor within said inner space and coextensive with the electrode and in clearing relationship with said tube, a cooling fluid circulating within said tube and a heat ex-

changer in communication with said tube and means for circulating said cooling fluid therethrough, and electrical connec-



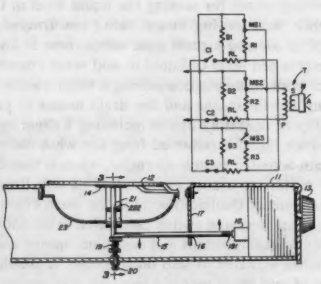
tions for connecting said metal and said encased electrodes to the required polarity.

4,334,145

ENERGIZED RANGE BURNER SIGNAL

Robert L. Norris, Sr., 2701 E. Utopia #112, Phoenix, Ariz. 85024

Filed Oct. 6, 1980, Ser. No. 194,580
Int. Cl.³ H05B *1/02, 3/68*
U.S. Cl. 219—453 **10 Claims**



10. In combination:
an electrical resistive heating element;
a selector switch for connecting a source of electrical power across said element; and
alarm circuit means for sensing when electrical power is connected across said element for sensing when a utensil is positioned on said element, and for producing an alarm signal only when power is connected across said element and no utensil is positioned on said element.

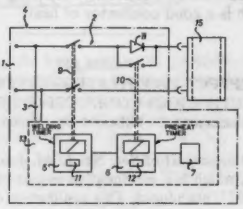
4,334,146

METHOD AND APPARATUS FOR JOINING THERMOPLASTIC LINE ELEMENTS

Werner Sturm, Allerheiligenstr. 624, Hügendorf, Switzerland

PCT No. PCT/CH79/00059, § 371 Date Dec. 28, 1979, § 102(e) Date Dec. 11, 1979, PCT Pub. No. WO79/01000, PCT Pub. Date Nov. 29, 1979
PCT Filed Apr. 26, 1979, Ser. No. 177,760
Claims priority, application Switzerland, Apr. 28, 1978, 4696/78
Int. Cl.³ H05B *1/02*
U.S. Cl. 219—492 **1 Claim**

1. An apparatus for joining thermoplastic line elements, comprising
a thermoplastic welding sleeve with an electrical resistance heating wire winding disposed therein; and
power control means, electrically coupled to said heating wire winding, for supplying and regulating electrical power to said heating wire winding, said power control means including
a welding circuit coupled to said heating wire winding for conducting electrical power thereto and having a main switch connected in series with said heating wire winding,
an overall timing means, coupled to said main switch, for controlling actuation thereof,
power level selecting means, in said welding circuit in series with said main switch and heating wire winding, for selectively regulating the electrical power supplied to said heating wire winding to either of a rated welding power level or a preheating power level, said power



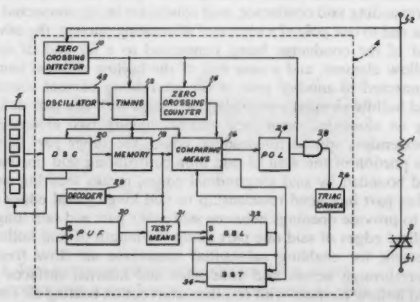
selecting means comprising a diode bridged by a preheating switch connected in parallel with said diode,
a preheating timing means, coupled to said preheating switch, for controlling actuation of said power level selecting means by actuating said preheating switch, and
said overall timing means and said preheating timing means having means for indicating the operating stage of said welding cycle;
whereby said overall timing means and said main switch start and stop a welding cycle of said sleeve by controlling interruptions of said welding circuit, and said preheating timing means and said power level selecting means vary the electrical power during said welding cycle.

4,334,147

POWER CONTROL FOR APPLIANCE USING HIGH INRUSH CURRENT ELEMENT

Thomas R. Payne, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Feb. 1, 1979, Ser. No. 8,376
Int. Cl.³ H05B *1/02*
U.S. Cl. 219—497 **13 Claims**



1. A power control system for controlling power delivered to a heating element in response to selection of one of a plurality of power control settings including an OFF setting, said

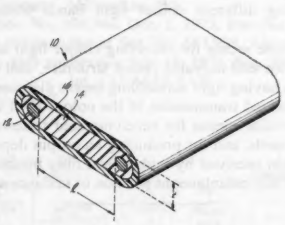
settings corresponding to different levels of power applied to said heating element, said element exhibiting a relatively high resistance at high temperatures and a relatively low resistance at low temperatures, at least one of said power level settings operative to deliver power to said element, when at said relatively low temperature, which results in a current level which exceeds an acceptable limit, said power control system including transition detection means operating independently of current and voltage in said element for detecting a transition from said OFF setting to said one power setting, transient control means responsive to said detection means for delivering power to said element for a preselected time at a level lower than that associated with said one power setting, when said transition is detected, said lower power level being sufficiently low that current in the element does not exceed said acceptable limits, and steady state control means for controlling power to said element in accordance with said one setting after expiration of said preselected time.

4,334,148

PTC HEATERS

Andrew J. Kampe, Half Moon Bay, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 608,660, Aug. 28, 1979, abandoned.
This application Jan. 16, 1978, Ser. No. 869,786
Claims priority, application United Kingdom, Aug. 30, 1974, 38059/74
Int. Cl.³ H05B *3/12*
U.S. Cl. 219—553 **2 Claims**



1. A self-regulating PTC strip heater comprising two parallel spaced-apart rod-like electrodes embedded in and enclosed by a web of PTC material which consists of an extruded homogenous mixture comprising carbon black dispersed in a polymeric material, said web of PTC material having a generally rectangular cross-section and having a generally retangular cross-section between the electrodes and having a substantially constant thickness t, said thickness t being greater than the maximum dimension of the electrodes in the same direction, and said electrodes being spaced apart by a distance 1 such that the ratio 1/t is from about 3/1 to 5/1, the current path between said electrodes always being exclusively in said web of PTC material.

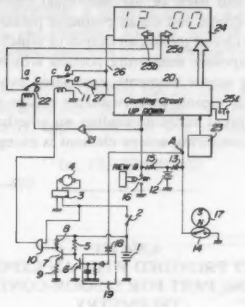
4,334,149

TAPE RECORDER WITH DISPLAY SHOWING TAPE TRAVEL DIRECTION

Kenji Furuta, Hachioji, Japan, assignor to Olympus Optical Company Limited, Hachioji, Japan

Filed Jan. 30, 1979, Ser. No. 7,808
Claims priority, application Japan, Feb. 1, 1978, 53/11168[U]
Int. Cl.³ G06M *3/14*
U.S. Cl. 235—92 MP **14 Claims**

1. A tape recorder, comprising a tape drive, tape counter means for counting tape, a tape direction switch, display means responsive to said tape counter means and said direction switch for displaying values indicative of the tape count when the tape counter means indicates that the tape is running, said display means including direction indicating markers, control means coupled to said tape drive and to said display means as well as said counter means and said direction switch for enabling the display of the markers only in response to both the tape drive



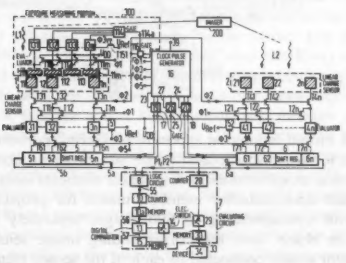
and the tape counter being operative and for causing said display means to indicate one of said markers in response to said direction switch.

4,334,150

CIRCUIT WITH AN EXPOSURE MEASURING UNIT FOR SENSOR CONTROLLED RANGE MEASUREMENT

Heiner Herbst, Munich; Hans-Joerg Pfleiderer, Zorneding, and Hans-Peter Grassl, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 11, 1980, Ser. No. 168,648
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1979, 2936491
Int. Cl.³ G01C *3/08*
U.S. Cl. 250—201 **12 Claims**



1. A circuit having an exposure measuring portion and designed for sensor-controlled range measurement, comprising: two linear semiconductor image sensors having sensor elements; means for projecting line segments corresponding to two images separately obtained from an object onto the corresponding image sensors; an evaluator means connected to each of the sensor elements for switching between two different states depending upon whether a reference charge in the sensor elements is exceeded so as to digitalize sensor signals; an evaluating circuit means for evaluating the digitalized sensor signals in dependence upon varying relative position shifts with respect to a maximum correlation; device means connected to the evaluating circuit means for evaluating a range of said object; means for determining integration time of the sensor elements including strip-shaped comparing sensor elements positioned for exposure to an optically generated charge quantity which corresponds to a plurality of sensor elements in at least one of the image sensors; said comparing sensor elements being arranged along a longitudinal axis parallel to said at least

one image sensor; dimensions of the individual comparing sensor elements along the longitudinal axis being substantially smaller than a corresponding dimension of the at least one image sensor; and each of the individual comparing sensor elements being connected via an evaluator means to associated inputs of a gate circuit means, an output of which represents an output of an exposure measuring portion which is formed of said comparing sensor elements, associated evaluator means, and gate circuit means, said evaluator means switching between two different states depending on whether a reference charge in the comparing sensor element is exceeded.

4,334,151

CIRCUIT PROVIDED WITH AN EXPOSURE MEASURING PART FOR SENSOR-CONTROLLED TELEMETRY

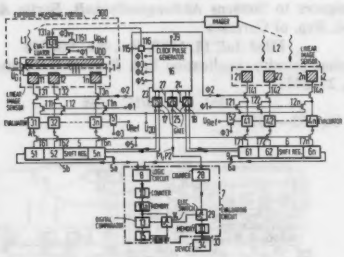
Heiner Herbst, Munich; Hans-Joerg Pfleiderer, Zorneding, and Hans-Peter Grassl, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 11, 1980, Ser. No. 168,649

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1979, 2936536

Int. Cl.³ G01C *3/08*

U.S. Cl. 250—201 **12 Claims**



1. A circuit having an exposure measuring portion and designed for sensor-controlled range measurement, comprising: two linear image sensors having sensor elements integrated on a doped semiconductor member; means for projecting line segments corresponding to two images separately obtained from an object onto the corresponding image sensors; and evaluator means connected to each of the sensor elements for switching between two different switching states depending upon whether a reference charge in the sensor elements is exceeded so as to digitalize sensor signals; an evaluating circuit means for evaluating the digitalized sensor signals in dependence upon varying relative position shifts with respect to a maximum correlation; device means connected to the evaluating circuit means for indicating a range of said object; an exposure measuring circuit having means for determining integration time of the sensor elements including a strip-shaped comparing sensor element co-integrated on the semiconductor member and longitudinally extending and positioned for exposure to an optically generated charge quantity which corresponds to a plurality of sensor elements in at least one of the image sensors; said comparison sensor element being designed as a strip-shaped photodiode arranged next to the sensor element row in at least one of the image sensors; and above a zone of the semiconductor member between the sensor element row and the comparison sensor element, a gate separated by a thin insulating layer from the semiconductor member is provided, said gate being subject to a constant voltage.

4,334,152

POSITION INDICATING SYSTEMS

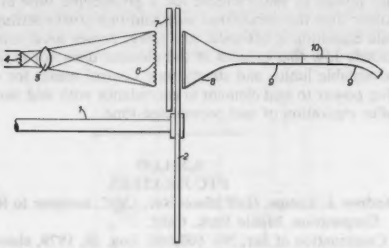
John P. Dakin, Chandlers Ford, and David A. Kahn, Bittern, both of England, assignors to Plessey Incorporated, New York, N.Y.

Filed Dec. 4, 1979, Ser. No. 100,144

Claims priority, application United Kingdom, Dec. 6, 1978, 47428/78

Int. Cl.³ G01J *3/34*

U.S. Cl. 250—226 **8 Claims**



1. A position indicating system for affording an indication of the instantaneous position of a movable member, comprising:

a coded structure rotatably movable in accordance with movement of said movable member;

deriving means associated with said coded structure for deriving different colour light bands from broadband light;

optical fibre means for receiving colour light bands emerging from said movable coded structure, said optical fibre means having light scrambling means disposed therein for multiplexed transmission of the colour light bands; and

light detector means for receiving said transmitted colour light bands, and for producing an output dependent upon the light received by said optical fibre means and indicative of the instantaneous position of said movable member.

4,334,153

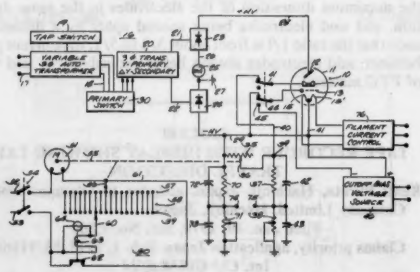
X-RAY TUBE GRID BIAS SUPPLY

Harold E. Stehman, Hales Corners, and Herbert E. Daniels, Brown Deer, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 29, 1980, Ser. No. 191,789

Int. Cl.³ H05G *1/00, 1/34*

U.S. Cl. 250—405 **5 Claims**



1. A system for providing a variable bias voltage for an x-ray tube that is adapted for varying its focal spot size, said tube comprising a target anode, cathode means spaced from the anode and including a filament and a first control electrode proximate to the filament, and a second electrode for controlling focusing located between said cathode means and said

anode, means for connecting said anode to the positive terminal of a dc kilovoltage supply which is above ground by a predetermined amount and means for connecting said filament of said cathode means to the negative terminal of said supply which is below ground by a predetermined amount, and

the improvement for applying to said second electrode a focus control bias voltage which will vary in proportion to any variations in the applied kilovoltage between said cathode means and ground when said x-ray tube is conducting such that said bias voltage will track said applied kilovoltage, comprising:

a first voltage divider means including at least two resistor means connected in a series circuit, at least one of which has means for adjusting its value for selecting bias voltage level, connected between said cathode means and ground, and

means for connecting a point intermediate of said resistor means to said second electrode to provide the bias voltage for focusing.

4,334,154

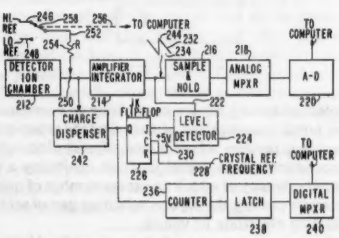
TOMOGRAPHIC SCANNING APPARATUS

Paul Sandland, Half Moon Bay, Calif., assignor to General Electric Company, Milwaukee, Wis.

Division of Ser. No. 856,946, Dec. 2, 1977, Pat. No. 4,236,079, which is a continuation of Ser. No. 667,938, Apr. 19, 1976, abandoned. This application Sep. 18, 1978, Ser. No. 943,076

Int. Cl.³ A61B *6/00*

U.S. Cl. 250—445 T **1 Claim**



1. An apparatus for examining a subject by means of penetrating radiation and providing a digital output signal for use in reconstruction of a representation of the structure residing in a section taken through said subject; said apparatus comprising:

means for causing penetrating radiation to enter said subject at a plurality of locations around said section, and detector means for detecting radiation passing through said section; and

signal processing means for receiving the output signals from said detector means and amplifying and converting said signals to digital form;

the improvement wherein:

said signal processing means includes integrator means for integrating the output signals from said detector means, means for resetting said integrator means upon the integrated signal reaching a selected level, means for counting the resets generated by said detector output signal to provide a coarse measure of said output signal, and means for measuring the remaining signal level from said integrator means to provide a fine measurement of said detector output signal, whereby said processing means is relatively sensitive to a wide range of said detector signals.

4,334,155

X-RAY EXAMINATION APPARATUS, COMPRISING AN EXAMINATION TABLE WHICH CAN BE SWIVELLED AROUND A HORIZONTAL AXIS

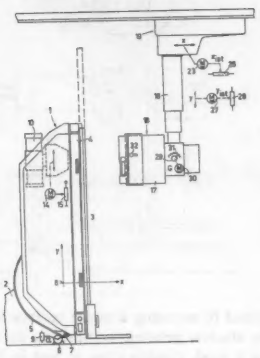
Kurt Gieschen, and Friedrich Reinger, both of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 56,478, Jul. 11, 1979, abandoned. This application Jun. 24, 1980, Ser. No. 162,694

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1978, 2831058

Int. Cl.³ H05G *1/02*

U.S. Cl. 250—490 **6 Claims**

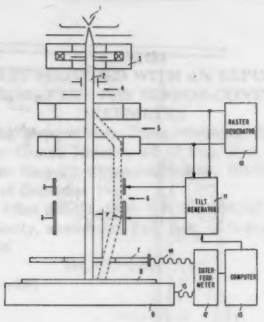


1. An X-ray examination apparatus comprising: an examination table (1) which is swivelable around a horizontal axis (8); an X-ray source (10) which is displaceable parallel to the top of the table (3) and perpendicularly to the swivel axis (8); an image detector (16) which is directed onto the X-ray source (10) in all swivel positions and which is situated on an opposite side of the table top (3) therefrom; and a first measuring device (9) which supplies a first signal which is a measure of the inclination of the examination table (1); characterized in that the apparatus includes stand arrangement means, an apparatus section which includes either the image detector (16) or the X-ray source (10) being mounted on the stand arrangement means (19) said apparatus section being movable independently of the examination table (1) and swivelable around an axis (29) which is parallel to the swivel axis (8), and further comprises: first drive motor means, (30) which comprises a first control circuit, which link the inclination of the apparatus section (16) to the inclination of the examination table (1); second and third drive motor means (23, 27) which displace said apparatus section (16) in two mutually perpendicular directions which define a plane transversely of the swivel axis, and include, respectively, second and third measuring devices (26, 28), each of which generates a signal (x_{ist}, y_{ist}) which corresponds to the position or the displacement of the stand arrangement means (19) or of the apparatus section (16) in the plane perpendicular to the swivel axis (8); at least one arithmetic device (38) which, during a swivelling movement of the examination table (1), continuously calculates, from the signals (α_O, x_O, y_O) generated by the three measuring devices (9, 26, 29) in a preceding position of the table, the position (x, y) or displacement of the apparatus section in a subsequent swivelled position (α) and controls the first motor drive means therewith so that the orientation and the distance of the apparatus section (16) with respect to the examination table (1) remains unchanged, said arithmetic unit also controlling the second and the third drive motor means (23, 27).

4,334,156
METHOD OF SHADOW PRINTING EXPOSURE

Harald Bohlen, Boeblingen; Helmut Engelke, Altdorf; Werner Kulcke, Boeblingen; Peter Nehmiz, Stuttgart, and Johann Greschner, Pliezhausen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 28, 1979, Ser. No. 70,453
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1978, 2837590
Int. Cl.³ H01J 37/00
U.S. Cl. 250—491 11 Claims



1. A method of exposing a target surface to particle beam radiation by shadow printing, comprising the steps of:

arranging a mask suitable close to and in front of a target surface and at approximately a predetermined alignment position with respect to said target surface;

forming a particle beam having a cross-section which is much smaller than the whole region of said mask to be exposed to said particle beam at said predetermined alignment position;

subdividing said whole mask region to be exposed to said particle beam into a multiplicity of individual subareas;

determining the individual alignment error of each of said subareas of said mask region by determining the deviation of the actual position of each individual subarea from a predetermined nominal position thereof;

steering said particle beam so as to expose said individual subareas of said mask region successively to said particle beam; and

while exposing each successive subarea to said particle beam, compensating for the individual alignment error determined for said subarea by controllably tilting said particle beam in a direction and by an amount corresponding to said individually determined alignment error.

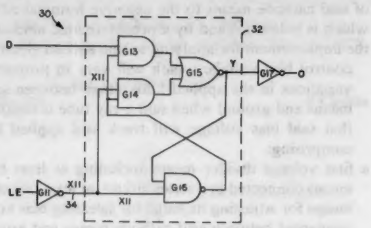
4,334,157
DATA LATCH WITH ENABLE SIGNAL GATING

David A. Ferris, West Buxton, Me., assignor to Fairchild Camera and Instrument Corp., Mountain View, Calif.

Filed Feb. 22, 1980, Ser. No. 123,717
Int. Cl.³ H03K 3/288, 17/00
U.S. Cl. 307—291 14 Claims

1. In a new and improved data latch having an input and output and at least two operative modes, a transmitting or transparent mode for transmitting data signals through the latch and a latching mode for latching and temporary storage by feedback of data signals in the latch, said data latch including enable gating signal means for switching the data latch between the transmitting and latching modes, the improvement comprising:

pregate means for pregating feedback data signals in the latch, said pregate means operatively coupled to the data latch output and enable gating signal means to provide positive feedback data signals in the latching mode, said

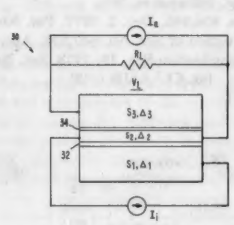


pregate means also operatively coupled to provide gating signals for passing data in the transmitting mode.

4,334,158
SUPERCONDUCTING SWITCH AND AMPLIFIER DEVICE

Sadeg M. Faris, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 6, 1980, Ser. No. 156,948
Int. Cl.³ H03K 17/92, 19/195, 3/38
U.S. Cl. 307—462 67 Claims



1. A superconducting device comprising in combination:

a tunnel junction comprised of two electrodes separated by a tunneling barrier, wherein one of said electrodes is a superconductor, said tunnel junction exhibiting a threshold power density at which an excess number of quasi-particles exists causing the superconducting gap of said superconducting electrode to vanish,

means for injecting power of the order of said threshold power density into said superconducting electrode,

load means connected to said tunnel junction for receiving the output of said tunnel junction.

4,334,159
SLIP RING COOLING DEVICES FOR ELECTRICAL ROTARY MACHINES

Norihiro Ooki, Katsuta; Shoji Motegi, and Masatoshi Watanabe, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 29, 1980, Ser. No. 154,478
Claims priority, application Japan, May 29, 1979, 54/65616
Int. Cl.³ H02K 9/28
U.S. Cl. 310—54 13 Claims

1. An electrical rotary machine, comprising:

an annular slip ring having a peripheral portion and axially opposite side portions;

a plurality of chambers formed in said slip ring at the peripheral portion of said ring with intervals in the peripheral direction, for enclosing cooling liquid and its vapor, said chambers each extending axially from one end at one side portion of said slip ring to an opposite end at the other side portion;

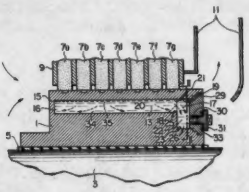
common passage means, provided at the one side portion of said slip ring and fluid communicating with only the one end of each of said plurality of chambers;

means fluid sealing the remainder of each of said chambers;

means hermetically sealing liquid volatile at the working temperature of said slip ring and its vapor within said communicating passage means and chambers;

said passage means including an annular passage that extends radially outward substantially at least as far as the radially outermost portions of said chambers and that extends radially inward a substantial distance beyond the radially innermost portions of said chambers;

said passage means providing an outer axial free liquid flow path for liquid coolant freely from said annular passage to said one end of each of said chambers, that is substantially at the radius of the radially outermost portions of said chambers, and further providing an inner axial free liquid flow path from the one end of said chambers to said annular passage at substantially the same radius as the innermost portions of said chambers;



means providing cooling for the liquid within said annular passage; and

said passage means uniformly distributing the cooled liquid from said annular passage along said outer path to each of said chambers by centrifugal force applied on the liquid by the rotation of said slip ring so that the liquid may travel axially from said one end to said other end along the outermost portions of each of said chambers to be heated and partially vaporized, so that heated liquid and its vapor will travel axially along the inner portions of said chambers from said other end to said one end through a lower path and into said annular passage, and said annular passage will receive gases within its innermost portion generally radially inward of said chambers so that the vapor is condensed and the liquid cooled in said annular passage for recirculation to said chambers.

4,334,160

ROTATING ELECTRICAL MACHINE

Frederick B. McCarty, San Pedro, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

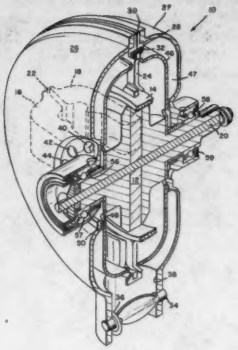
Filed Apr. 27, 1979, Ser. No. 34,086
Int. Cl.³ H02K 9/08
U.S. Cl. 310—57 **22 Claims**

1. A rotating electrical machine, comprising:

a machine housing;

a rotor assembly rotatably mounted with said machine housing for providing magnetic flux, said rotor assembly comprising a plurality of pairs of oppositely-polarized permanent magnetic poles spaced apart to form a plurality of air gaps therebetween, said pairs of oppositely-polarized permanent magnetic poles forming magnetic fields within said air gaps, said magnetic fields all being in the same direction; and

an ironless stator assembly, said ironless stator assembly comprising a plurality of multi-turn coils bonded together to form an annular shape having an outer circumference, said ironless stator assembly being positioned within said air gaps to provide magnetic flux linkage between said rotor assembly and said ironless stator assembly, said ironless stator assembly including means for connecting said outer circumference thereof to said machine housing to support said ironless stator assembly therewithin, said



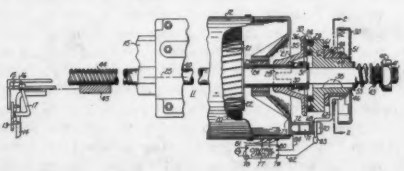
connecting means being the only supporting connection to said said stator assembly.

4,334,161

CENTRIFUGAL SWITCH AND MOTOR CONTROL

Alvin J. Carli, Sebring, Ohio, assignor to The Alliance Manufacturing Company, Inc., Alliance, Ohio

Filed Nov. 8, 1979, Ser. No. 92,453
Int. Cl.³ H02K 11/00
U.S. Cl. 310—68 E **19 Claims**



1. A centrifugal switch for use with a frame comprising, in combination,

a rotatable member having an axis of rotation,

first and second coacting conductor members in said centrifugal switch,

said second conductor member including a substantially circular portion coaxial with said axis,

said first conductor member including a spring blade,

said spring blade being long relative to the width thereof and wide relative to the thickness thereof,

means mounting said spring blade near one end thereof for rotation with said rotatable member and mounting weight means near the other end thereof to have the spring blade act as a cantilever spring blade whereby upon rotation of said rotatable member at a predetermined speed the weight means urges said cantilever blade out of engagement with said second conductor member and whereby when said rotatable member is rotating at less than said predetermined speed said cantilever blade engages said second conductor member as a switch-closed condition.

4,334,162

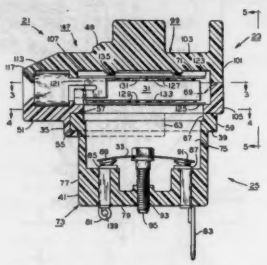
RELEASABLE COMBINATION AND METHOD OF ASSEMBLY

Donald L. Haag, Sterling, and Lee O. Woods, Morrison, both of Ill., assignors to General Electric Company, Fort Wayne, Ind.

Filed Mar. 17, 1980, Ser. No. 131,218

Int. Cl.³ H02H *5/04;* H02K *11/00*

U.S. Cl. 310—68 C **44 Claims**



1. A releasable combination of a separable starter device and a separable protector device for connection in circuit relation with a winding circuit of a dynamoelectric machine, the releasable combination comprising:

casing means for said separable protector device and including a first sidewall disposed between a pair of generally opposite first end walls, one of said first end walls comprising a first flange extending generally circumferentially about said first sidewall generally radially thereof, a first chamber within said first sidewall between said first end walls, and a first opening through said one first end wall intersecting with said first chamber;

thermally and current responsive switch means mounted to the other of said first end walls within said first chamber for the connection in the circuit relation with the winding circuit of the dynamoelectric machine when said starter device and said protector device are in the releasable combination thereof;

housing means for said separable starter device comprising a second sidewall disposed between a pair of generally opposite second end walls, a second chamber within said second sidewall between said second end walls, a second opening through one of said second end walls intersecting with said second chamber and arranged to communicate with said first opening in said casing means when said starter device and said protector device are in the releasable combination thereof, a pair of apertures extending through said second sidewall and intersecting with said chamber, means for defining a yieldable section of said housing means including a slot through said one second end wall and at least or part of said second sidewall and intersecting with said second chamber and said second opening, a second flange extending from said one second end wall exteriorly of said housing generally coaxially with said second opening and sized to extend in seating engagement generally circumferentially about at least a major portion of said first flange on said casing means, a pair of opposed adjacent free ends on said second flange and spaced apart on opposite sides of said slot, and means between said free ends of said second flange for the passage therethrough of said first flange on said casing means, said yieldable section of said housing being initially yieldable to effect the spreading apart of said free ends on said second flange in response to an assembly force applied on at least one of said housing means and said casing means urging said first flange into interfering engagement with said free ends on said second flange and the subsequent passage through said passage means of said first flange on said casing means into the seating engagement with said second flange, and said yieldable section thereafter resiling to reposition said free ends on said second flange in releasable displacement preventing engagement with said first flange on said casing means thereby to releasably maintain said protector device and starter device against separation from the releasable combination thereof;

a PTCR disposed in said second chamber in thermal coupling relation through said first and second openings with said switch means when said starter device and said protector device are in the releasable combination thereof, and a pair of opposite contact sides on said PTCR;

a pair of contact plates arranged in said second chamber in electrical contacting engagment with said opposite contact sides of said PTCR and disposed at least adjacent said second end walls, respectively; and

a pair of female terminal means arranged at least in part in said apertures and connected with said contact plates, respectively, for the connection in the circuit relation with the winding circuit of the dynamoelectric machine when the starter device and the protector device are in the releasable combination thereof.

4,334,163

DC ELECTRIC MOTORS

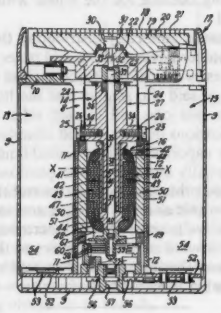
Enzo Ascoli, Lausanne, Switzerland, assignor to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 862,709, Dec. 21, 1977, abandoned. This application Oct. 1, 1979, Ser. No. 81,492

Claims priority, application United Kingdom, Jun. 4, 1977, 23835/77

Int. Cl.³ H02K *5/16*

U.S. Cl. 310—90 **6 Claims**



1. A DC electric motor comprising a stator, a shaft, a rotor secured to said shaft for rotation within said stator, spaced bearings for said shaft, a tubular support having first and second opposite ends and carrying said spaced bearings, said shaft being journalled in said bearings for coaxial rotation within said tubular support, said shaft having a driven end portion extending from said first end of said tubular support and a driving end portion extending from said opposite end of said tubular support, said rotor comprising a hollow cylindrical body, a lamination stack carried by said body, said lamination stack being formed with a plurality of generally longitudinally extending slots, and a rotor winding comprising a plurality of coils having coil sides formed by winding a number of turns of wire around said lamination stack and into said slots in a regular lapping pattern so that each slot receives only one coil side of only one coil to provide a symmetrical winding to make said rotor substantially balanced mechanically, means securing said body at only one end thereof to said driven end portion of said shaft so that said first end length of said tubular support is coaxially freely received within said hollow cylindrical body, a commutator having a plurality of segments equal in number to one half the number of said slots, means mounting said commutator to said driven end portion of said shaft at the

exterior side of said body remote from said tubular support, a circuit board extending transverse to the axis of said motor at the commutator end thereof, brushes for said motor formed of substantially 98% copper, 1.8% beryllium, and 0.2% lead for cooperating with said commutator formed of an alloy of substantially 70% silver and 30% palladium, and means for securing said brushes to said circuit board.

4,334,164

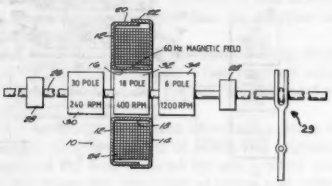
MULTI-SPEED PERMANENT MAGNET MOTOR

Kenji Yatsushiro, Chicago, and George F. Kuchuris, Bloomingdale, both of Ill., assignors to The Singer Company, Stamford, Conn.

Continuation of Ser. No. 924,951, Jul. 17, 1978, abandoned. This application Jan. 14, 1980, Ser. No. 112,128

Int. Cl.³ H02K *16/00*

U.S. Cl. 310—114 **3 Claims**



1. An electric motor comprising,

a stator assembly including a coil and at least six stator poles each of which has an angular embrace equal to 360° divided by the number of stator poles,

the flux of all said stator poles being in phase and the magnetic field of each of said stator poles being unbalanced in the same direction by removal of material from the same half of each stator pole,

a rotor assembly coaxial with the stator assembly and having a rotor shaft and a plurality of rotors mounted on the shaft,

one assembly being movable with respect to the other assembly to selectively position one of the rotors in the field of said coil,

said rotors being permanently magnetized to provide rotor poles, each rotor having a different number of poles and the number of poles in each rotor being a whole odd number multiple of the number of stator poles so there is always an odd number of rotor poles within the embrace of each stator pole to ensure starting while the rotational speed of the rotor assembly is determined by the number of rotor poles in the rotor positioned in the field of the coil.

4,334,165

COPPER-STEEL COMPOSITE COMMUTATOR BAR

William G. Moffatt, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 19, 1980, Ser. No. 122,528

Int. Cl.³ H02K *13/10*

U.S. Cl. 310—233 **22 Claims**

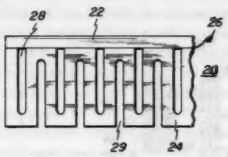
1. A duplex commutator bar resistant to interfacial delamination due to differential thermal expansion for mounting in an electrical commutator, said bar comprising

an elongated iron base alloy body having an upper longitudinal surface and a lower longitudinal surface,

a first plurality of spaced expansion joints extending from said upper longitudinal surface to an interior portion of said body,

a second plurality of spaced expansion joints extending from said lower longitudinal surface to an interior portion of said body and

a solid electrically conducting copper section bonded longitudinally to the upper longitudinal surface of said body



along a plurality of separate interface regions between said body and said section.

4,334,166

ROTARY MAGNETIC SENSOR

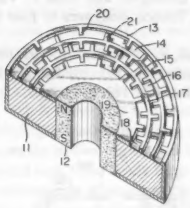
Nobufumi Miyahara, Yokohama, and Takashi Uchida, Hayama, both of Japan, assignors to Kanto Kasei Kogyo Kabushiki Kaisha, Kanagawa, Japan

Continuation of Ser. No. 862,288, Dec. 19, 1977, abandoned. This application Feb. 19, 1980, Ser. No. 122,821

Claims priority, application Japan, Jan. 19, 1977, 52-4021; Jan. 19, 1977, 52/4032

Int. Cl.³ H02K *1/22*

U.S. Cl. 310—268 **10 Claims**



1. A rotary magnetic encoder for magnetically detecting rotation and angular position of a rotary member and for generating electrical signals representing the rotation and angular position of said rotary member comprising a rotary body made of non-magnetic solid material, an annular magnet provided in the center of said rotary body for rotation with said body, a magnetic film formed on the surface of said rotary body having respective portions magnetically connected with opposite poles of said annular magnet, a magnetic-film pattern formed in said magnetic film in which magnetic flux distribution is varied in the rotating direction of said rotary body and a stationary magnetic detector disposed adjacent only a portion of the rotary path of said magnetic-film pattern for sensing changes in magnetic flux caused by said magnetic-film pattern as said pattern rotates with said rotary body past said detector and for generating electrical signals corresponding to the rotation and angular position of said rotary body.

4,334,167

ELASTIC SURFACE WAVE DEVICE

Shoichi Minagawa, and Takeshi Okamoto, both of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed May 27, 1980, Ser. No. 153,238

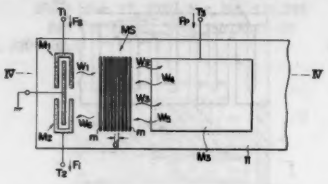
Claims priority, application Japan, May 28, 1979, 54-64923

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—313 R **9 Claims**

1. In an elastic surface wave device comprising a body having an input electrode, an output electrode and a pump electrode provided thereon, wherein the improvement com-

prises: said output electrode is juxtaposed with said input electrode on the same side of said body with reference to said pump electrode and wherein a further electrode for outputting



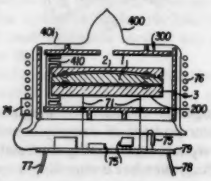
through said output electrode a backward wave signal from said pump electrode is provided at an intermediate position between said input and output electrodes and said pump electrode.

4,334,168

HIGH FREQUENCY, THERMOSTATICALLY SELF CONTROLLED OSCILLATOR

Raymond J. Besson, Besancon, and Jean P. Valentin, Pouilley les Vignes, both of France, assignors to Etat Francais, Paris, France

Filed Jul. 8, 1980, Ser. No. 166,907
Claims priority, application France, Jul. 19, 1979, 79 18553
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—343 **21 Claims**



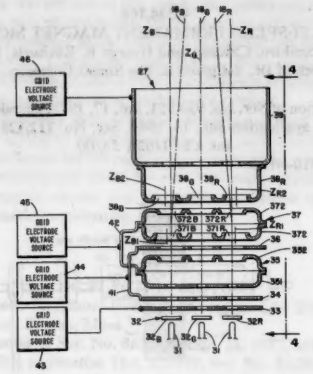
1. High frequency, thermostatically self-controlled, oscillator of a type that comprises a piezoelectric resonator mounted in a sealed container and composed of at least one piezoelectric crystal provided with a continuous peripheral section that forms a ring connected to a central section by an intermediate zone which is recessed over the greater part of its area and comprises at least two connection bridges to connect the central section and the peripheral section solidly together, and two dielectric plates to hold and maintain the exciting electrodes, without contact with, and respectively opposite, each of the sides of one of the central and peripheral sections which then constitutes the active vibrating part of the crystal, the other part of the crystal that constitutes a support part for the crystal is maintained in position between the said dielectric plates, characterised by the fact that the contact between the top part of the crystal and the two dielectric plates is limited to a discontinuous surface of reduced extent composed of a finite number of contact surfaces elements, by the fact that at least one infra-red reflecting screen is disposed inside the sealed container in the immediate vicinity of the piezoelectric resonator, and by the fact that the electric power applied to the exciting electrodes is at least 50 microwatts approximately.

4,334,169

ELECTRON GUN STRUCTURE

Shigeo Takenaka, Fukaya; Eizaburou Hamano, Kumagaya, and Shinpei Koshigoe, Fukaya, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 17, 1979, Ser. No. 85,678
Int. Cl.³ H01J *29/56, 29/46*
U.S. Cl. 313—414 **9 Claims**



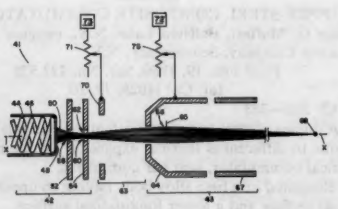
1. An electron gun system comprising:
a cathode means, positioned on an electron gun axis, for emitting an electron beam along a beam path;
a plurality of grid electrodes arranged along said electron gun axis, a first voltage source coupled to at least one of said grid electrodes for forming a plurality of electrostatic lenses on said electron gun axis for focusing said electron beam;
a focus control means coupled to a first voltage source for controlling said focusing; and
wherein at least three of said grid electrodes comprise asymmetric deflecting means for forming at least two asymmetric electrostatic lenses along said electron gun axis for deflecting said electron beam.

4,334,170

MEANS AND METHOD FOR PROVIDING OPTIMUM RESOLUTION OF T.V. CATHODE RAY TUBE ELECTRON GUNS

Robert G. Rockwell, Arlington Heights, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Sep. 28, 1979, Ser. No. 79,926
Int. Cl.³ H01J *29/46, 29/56*
U.S. Cl. 315—16 **6 Claims**



1. For use in a television cathode ray tube of the direct view or projection type having associated therewith a power supply for developing a predetermined pattern of operating voltages including at least first and second adjustable voltages, an electron gun having apertured electrodes aligned on an axis for

receiving said operating voltages to produce a focused beam of electrons comprising:

lower end means for generating an electron beam having a crossover, said beam expanding in the aperture of a prefocusing electrode, the outer rays of said expanding beam defining a half-angle with respect to said axis;

main focus lens means adjacent to prefocusing electrode for receiving said expanding beam and focusing said beam to form a beam spot of minimum size at a predetermined distance from said gun, said main focus lens means having at least a focusing electrode for receiving said first adjustable voltage for focusing said beam spot, said main focus lens means, by its inherent characteristics, being capable of focusing a minimum beam spot whose size is a function of the beam half angle;

said gun being characterized by having:

at least one half-angle control element located in the region between said prefocusing electrode and said main focus lens means and relatively widely spaced from said prefocusing electrode, the aperture of said control element being relatively larger than the aperture of said prefocusing electrode;

means for receiving a second adjustable voltage from said power supply in the range of a few hundred volts plus or minus relative to the voltage on said prefocusing electrode;

means for applying said second adjustable voltage to said half-angle control element of selectively adjusting the strength of the field induced by said control element, such that when said means for adjusting said voltage on said control element is adjusted to increase the strength of the half-angle control field, said half-angle is increased; and conversely, when said voltage is adjusted to decrease the strength of the half-angle control field, said half-angle is decreased; and

means for fixing said second adjustable voltage for maintaining a selected constant optimum voltage on said control element, effective to cause the size of the focused beam spot to remain essentially minimum for equal focus voltage at different current levels.

4,334,171

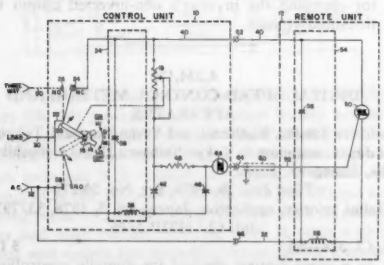
LIGHT DIMMER SWITCH HAVING REMOTE LOAD CURRENT SWITCHING

Dan F. Parman; LeMoey M. Wiebush, both of San Antonio; Fred M. Shaw, Universal City, and James P. Cummins, San Antonio, all of Tex., assignors to Power Controls Corporation, San Antonio, Tex.

Continuation-in-part of Ser. No. 942,191, Sep. 14, 1978, abandoned. This application Jul. 7, 1980, Ser. No. 166,057

Int. Cl.³ G05F *1/00*

U.S. Cl. 315—199 **4 Claims**



1. A switch for varying current received by a load from a source of AC power, said switch including a control unit and a remote unit;

said control unit in a first housing comprising means for connecting said load and said source of AC power to a control circuit contained in a control housing of said control unit, said control circuit including first switching means for providing a gate signal during each half cycle of said source of AC power, a vertically actuated lever pivotally mounted in said control housing operating full ON and full OFF contacts at opposite end of pivotal movement thereof, said lever simultaneously with movement to position intermediate positions between said full ON and full OFF changing variable resistance means in said control circuit connected in series with said source of AC power and said load and to said first switch means to vary a trigger point of said first switching means, wiper means of said variable resistance means being position by said vertically actuated lever mounted in said control housing;

said remote unit in a second housing comprising second switching means mounted on a heat sink inside a second housing, said second housing being remotely located from said first housing, said remote unit having at least three leads connecting to said control circuit of said control unit, a first of said leads connecting said gate signal to a gate terminal of said second switching means, a second of said leads connecting said source of AC power to a first side of said second switching means, and a third of said leads connecting said load to a second side of said second switching means, said second switching means receiving said gate signal during each half cycle of said source of AC power to allow conduction of load current therethrough when not disconnected or bypassed by said contacts, heat from said second switching means being dissipated in said heat sink;

electrical connecting means for said leads comprising a thin, electrically insulating thermally conductive strip having one side secured to said heat sink and terminals positioned on a second side of said strip, said strip and said terminals being attached to said heat sink by screws, said screws being electrically insulated from said heat sink and connecting to said first, second and third leads;

said switch having a maximum rating of between 600 watts to 3000 watts for delivering to said load, first filter means in said second and third leads between said control unit and said remote unit wherein said remote unit switches current being delivered up to said maximum rating, said first filter means preventing RFI noise from interfering with normal AM broadcast bands;

said control unit including said first housing and electrical connections thereto being adapted to fit inside a standard switch box without extra heat sinks attached thereto.

4,334,172

ADAPTOR FOR HIGH INTENSITY ARC DISCHARGE LAMPS

Elliott F. Wyner, Peabody; Orville R. Burr, Beverly, both of Mass., and Robert L. Garrison, Henniker, N.H., assignors to GTE Products Corporation, Stamford, Conn.

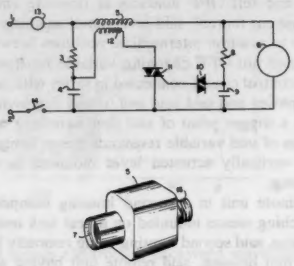
Continuation of Ser. No. 808,126, Jun. 20, 1977, abandoned. This application Sep. 22, 1980, Ser. No. 189,552

Int. Cl.³ H05B *41/16*

U.S. Cl. 315—289 **2 Claims**

1. An adaptor for operation of a high intensity arc discharge lamp comprising: a first and second wire for connecting the adaptor to an AC power source; the combination of a first resistor in series with a first capacitor, electrically connected between the first and second wires; a series circuit of an inductor, a second resistor and a second capacitor, electrically connected in parallel with said combination; a trigger winding on the inductor, one end of which is connected to a point between said first resistor and said first capacitor, the other end of which is connected to one end of a triac, the other end of the

triac being connected to said second wire; the gate of the triac being connected to one side of a diac, the other side of the diac



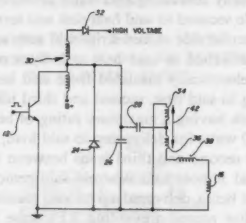
being connected to a point between said second resistor and said second capacitor.

4,334,173

HORIZONTAL WIDTH CONTROL CIRCUIT FOR IMAGE DISPLAY APPARATUS

Melvin E. Gabriel, Schaumburg, and Joseph M. Van Baalen, Vernon Hills, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Sep. 22, 1980, Ser. No. 189,252
Int. Cl.³ H01J *29/70*
U.S. Cl. 315—399 **3 Claims**



1. In an image display apparatus of the type having a horizontal deflection coil responsive to a horizontal deflection circuit for horizontally deflecting an electron beam across the screen of a CRT, a horizontal width control circuit comprising:

a first inductor connected in series relationship with said horizontal deflection coil;

a second inductor connected in shunt relationship with said horizontal deflection coil; and

means manually operable for simultaneously varying the impedance of said first and second inductors in opposite directions to maintain the composite inductance thereof substantially constant, whereby to control the extent to which said electron beam is horizontally deflected across said CRT screen without detuning said horizontal deflection circuit.

4,334,174

SAWTOOTH WAVEFORM GENERATION FOR A TELEVISION RECEIVER

William R. Weissmueller, Wildwood, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Sep. 21, 1979, Ser. No. 77,684
Int. Cl.³ H01J *29/70, 29/76*
U.S. Cl. 315—408 **1 Claim**

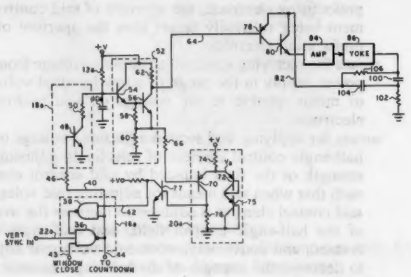
1. In a television receiver which receives vertical sync pulses as a part of a composite television signal and which includes vertical deflection circuitry responsive to an inverted sawtooth waveform, a circuit for generating an inverted sawtooth waveform for vertical deflection of a cathode ray tube's electron beam in synchronism with each such vertical sync pulse, comprising:

a capacitor for being charged and selectively discharged;

means for charging said capacitor so as to develop a ramp voltage thereacross;

a flip-flop adapted to receive a vertical sync pulse and a reset pulse for latching in a first operating condition in response to receipt of a vertical sync pulse and for latching in a second operating condition in response to receipt of a reset signal;

a transistor switch coupled between said flip-flop and said capacitor so as to discharge said capacitor in response to said first operating condition of said flip-flop and to discontinue that discharge in response to said second operating condition of said flip-flop;



a dual output inverter having an input receiving the capacitor voltage, a first output at which a non-inverted sawtooth waveform is generated and another output for coupling an inverted sawtooth waveform to the vertical deflection circuitry;

means for developing a threshold voltage; and

a comparator receiving the threshold voltage and the non-inverted sawtooth waveform from the inverter's first output for clamping the latter waveform to the threshold voltage and for developing the reset signal in response to the non-inverted sawtooth waveform being substantially equal to the threshold voltage,

whereby said capacitor charges to develop a ramp waveform during the interval between successive vertical sync pulses and discharges rapidly on receipt of each sync pulse to thereby develop a sawtooth waveform, and DC variations in the inverter's output are nullified by the comparator clamping the inverter's non-inverted output to the threshold voltage.

4,334,175

DIGITAL SPEED CONTROL METHOD AND APPARATUS

Hiroichiro Tanaka, Kunitachi, and Yasuo Nagatani, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Jun. 29, 1979, Ser. No. 53,271
Claims priority, application Japan, Jul. 3, 1978, 53/79758
Int. Cl.³ H02P *5/46*
U.S. Cl. 318—66 **5 Claims**

1. In a speed control method for digitally controlling the speeds of a plurality of motors provided in respective sections and operating in correlation with each other to form an operating line having an operating line speed, including the steps of:

(a) setting a line speed reference,

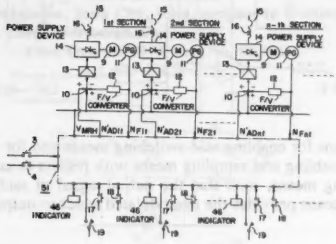
(b) establishing a predetermined sampling period,

(c) providing a speed difference set value for each section with respect to the line speed reference,

(d) detecting at every predetermined sampling period, the actual section speed of each section,

(e) calculating for each section a speed deviation in accordance with the line speed reference, the speed difference set value for the section, and the actual section speed for the section, and

(f) controlling the speed of the motor of each section in accordance with the speed deviation calculated for each section in step (e);



the improvement wherein said step (c) of providing a speed difference set value comprises the steps of:

(b_1) establishing a unit operation time period,

(b_2) operating a first manually operable switch to vary the speed difference set value of each section, and

(b_3) varying the speed difference set value for a section by a unit value for each unit operational time period which occurs during the manual operation of said first switch.

4,334,176

METHOD OF AND MEANS FOR CONTROLLING ELECTRICAL DEVICES

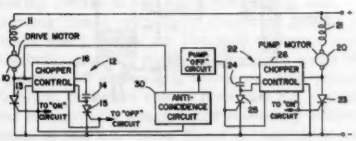
Kenneth A. Baumgartner, Peoria, Ill.; Grant C. Melocik, Chardon, Ohio, and Keith A. Stoller, Morton, Ill., assignors to Towmotor Corporation, Mentor, Ohio

PCT No. PCT/US79/00738, § 371 Date Sep. 11, 1979, § 102(e) Date Sep. 11, 1979, PCT Pub. No. WO81/00796, PCT Pub. Date Mar. 19, 1981

PCT Filed Sep. 11, 1979, Ser. No. 103,645

Int. Cl.³ H02P *1/58*

U.S. Cl. 318—102 **10 Claims**



10. In a system for controlling the operation of two electric motors (**10**, **20**) powered by a common battery source and including a different SCR chopper circuit (**12**, **22**) electrically connected in series with each electric motor across said battery source, each said SCR chopper circuit having a main current carrying SCR (**13**, **23**) with a second SCR (**15**, **25**) and a commutating capacitor (**14**, **24**) connected in series with each other across said main current carrying SCR through a chopper control, said system also including means having a capacitive element (**18**) for applying an "on" actuation control signal to one of said SCR chopper circuits to trigger the main current carrying SCR thereof into conduction and independent means for applying an "off" actuation control signal to the other of said SCR chopper circuits to trigger the second SCR thereof into conduction, the improvement comprising:

(a) a first voltage comparator (**32**) having one of its inputs connected to said capacitive element (**18**) of said means for applying an "on" actuation control signal to said one of said SCR chopper circuits;

(b) a first voltage source providing a voltage (**34**, **36**) within the range of voltage change on said capacitive element (**18**) connected to the other input of said first voltage comparator (**32**);

(c) a second voltage comparator (**42**);

(d) a pair of diodes (**38**, **40**) having their anodes connected to each other with the cathode of one (**38**) connected to the output of said first voltage comparator (**32**) and the cathode of the other connected to one input of said second voltage comparator (**42**);

(e) a second voltage source providing a given voltage connected to the junction between said anodes of said diodes (**38**, **46**);

(f) a resistor (**54**) and a capacitor (**56**) connected in parallel to said one input of said second voltage comparator (**42**) across said second voltage source;

(g) a third voltage source providing a voltage (**46**, **48**) less than said given voltage of said second voltage source connected to the other input of said second voltage comparator;

(h) means (**50**) connecting the output of said second voltage comparator to inhibit the operation of said means for applying an "off" actuation control signal to the other of said SCR chopper circuits; and

(i) means (**52**) connecting the anode of said main current carrying SCR of said one of said SCR chopper circuits to said junction between said anodes of said diodes (**38**, **40**).

4,334,177

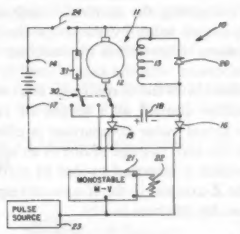
DC MOTOR CONTROL CIRCUIT

Van M. Lund, 9250 Forest View Rd., Evanston, Ill. 60203

Filed Aug. 25, 1980, Ser. No. 180,836

Int. Cl.³ H02P *5/16*

U.S. Cl. 318—345 G **4 Claims**



1. A circuit for control of a DC motor which includes an armature and a field winding, said DC motor being operative during application of a current to said armature to develop an output torque proportional to current flowing in said field winding, comprising: first and second semiconductor devices respectively connected in series with said armature and said field winding for connection between terminals of a battery or other DC source, a first electrode of said first device being connected to a first terminal of said armature, a first electrode of said second device being connected to a first terminal of said field winding, one terminal of said DC source being connected to second electrodes of said first and second devices, and the other terminal of said DC source being connected to a second terminal of said armature and to a second terminal of said field winding, a capacitor connected between said first electrodes of said semiconductor devices, and means for applying pulses to said semiconductor devices to initiate conduction of each device and thereby cut off conduction through the other, and diode means connected between said first and second terminals of said field winding for maintaining current flow through said field winding during nonconduction of said second semiconductor device connected in series therewith.

4,334,178

METHOD AND APPARATUS FOR CORRECTING TOOL LENGTHS AND TOOL RADII, PARTICULARLY FOR NUMERICALLY CONTROLLED MACHINES EQUIPPED WITH POSITION OR PATH MEASURING SYSTEMS BY MEANS OF NOMINAL-ACTUAL VALUE COMPARISON

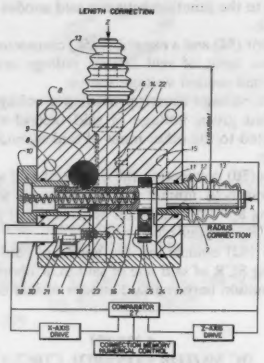
Willi Lipp, Witten-Annen, Fed. Rep. of Germany, assignor to Hüller Hille GmbH, Fed. Rep. of Germany

Filed Oct. 22, 1979, Ser. No. 86,948

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1978, 2847510

Int. Cl.³ G05B *19/24*

U.S. Cl. 318—572 **7 Claims**



1. A method of correcting tool lengths and tool radii, particularly for numerically controlled machines equipped with position or path measuring systems, by means of nominal-actual value comparison of the length and radius of the tool, comprising, comparing the nominal length and radius of the tool with an actual value by means of the position or path measuring system with which the machine is equipped and which are associated with the axes of motion of the tool, storing the difference with the correct sign in a correction memory of the numerical control as a length or radius correction, wherein, the actual value comparison is effected in the zero position or at the zero passage of one of an analog and a digital transmitter which is disposed so that its zero or zero passage position in the Z-axis and in the X-axis corresponds to constant spacings from the machine (a+b).

4,334,179

APPARATUS FOR DEMODULATING A PULSE EXCITED SYNCHRO POSITION SENSOR

Terrence L. Grimes, Phoenix, and Harold L. Swartz, Glendale, both of Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Jun. 16, 1980, Ser. No. 159,425

Int. Cl.³ G05B *1/06*

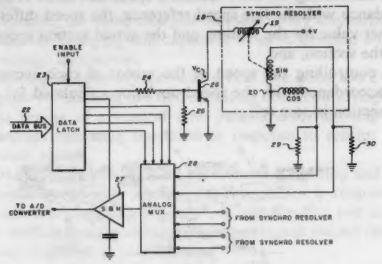
U.S. Cl. 318—661 **5 Claims**

1. Apparatus, for use with a synchro device which has excitation input winding means and at least first and second output winding means, and for providing demodulated synchro output signals, comprising:

means for applying a potential to said excitation input winding means;

switching means operatively coupled to said excitation input winding means for intermittently applying at any appropriate point in time said potential across said excitation input winding means such that at least successive first and second pulse waveforms are induced in said first and second output winding means;

sampling means selectively enabled and coupled to said first and second output winding means for sampling said successive first and second pulsed waveforms; and



means for enabling said switching means and for uniformly enabling said sampling means with respect to said switching means, such that the output signal of said sampling means provides the demodulated synchro output signals.

4,334,180

ELECTROMAGNETIC DRIVING MECHANISM FOR OSCILLATING DISPLACEMENT PUMPS

Guenter Bramm, and Pavel Novak, both of Munich, Fed. Rep. of Germany, assignors to Speidel & Keller GmbH & Co. KG, Jungingen, Fed. Rep. of Germany

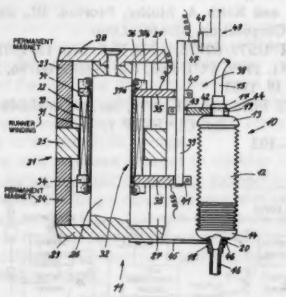
PCT No. PCT/DE79/00053, § 371 Date Jan. 17, 1980, § 102(e) Date Jan. 17, 1980, PCT Pub. No. WO79/01155, PCT Pub. Date Dec. 27, 1979

PCT Filed May 31, 1979, Ser. No. 190,323

Claims priority, application Fed. Rep. of Germany, May 31, 1978, 2823802

Int. Cl.³ G05B *11/00*

U.S. Cl. 318—687 **23 Claims**



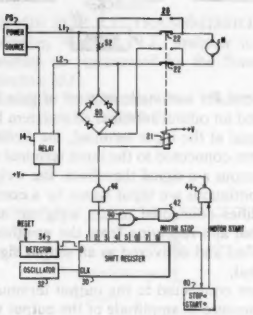
1. An electromagnetic drive mechanism for providing a controlled back and forth driving movement, comprising stator means including magnet means for providing respective stator magnetic fields, runner means, support means supporting said runner means for a linear back and forth displacement relative to said stator magnetic fields, runner winding means (31) operatively carried by said runner means, whereby said runner winding means interact with said stator magnetic fields during the movement of said runner means, a closed loop control circuit operatively connected to said runner winding means for controlling said driving movement, said closed loop control circuit comprising sensing means for sensing an instantaneous measured value to provide a corresponding first electrical signal representing an instantaneous parameter of said runner means, reference signal means for providing a second electrical signal representing a rated value, comparator means having a first input connected to said sensing means and a second input connected to said reference signal means for

comparing said first and second electrical signals with each other, and control circuit means connecting an output of said comparator means to said runner winding means for supplying a comparator output control signal to said runner winding means whereby the control of said runner means takes place during any displacement driving and within said back and forth movement.

4,334,181
MOTOR BRAKE

Dale W. Schroeder, Iowa City, Iowa, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 25, 1979, Ser. No. 88,306
Int. Cl.³ H02P *3/24*
U.S. Cl. 318—762 **2 Claims**



1. In a system or apparatus including an a.c. system motor connected to a principal a.c. electrical excitation source, the combination of,

detector means for detecting a system malfunction and generating an output signal indicative thereof,

braking circuit means, including a secondary power source means, responding to said output signal of said detector means by transferring the excitation of the a.c. system motor from the principal a.c. electrical excitation source to said secondary power source means to bring the a.c. system motor to a controlled stop in the event of a system malfunction, said secondary power source means including circuit means for applying a predetermined level of braking current to said a.c. system motor, and

sequencing means operatively connected to said detector means, said principal a.c. electrical excitation source and said braking circuit means to generate a series of output conditions to sequentially disconnect said principal a.c. electrical excitation source from said a.c. system motor and subsequently connect said secondary power source means to said a.c. system motor in response to an output signal from said detector means, said sequencing means including a multistage output shift register means and logic circuit means connected to said output to develop said series of output conditions, the output of said detector means being the input to said shift register means.

4,334,182
MOTOR CONTROL SYSTEM

Paul J. Landino, Orange, Conn., assignor to Zero-Max Industries, Incorporated, Minneapolis, Minn.

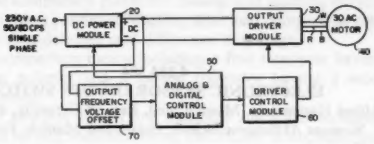
Filed Nov. 9, 1979, Ser. No. 92,746
Int. Cl.³ H02P *5/40*
U.S. Cl. 318—808 **8 Claims**

1. A motor speed control system comprising:

(a) an output module for generating an output waveform having a selected amplitude to frequency characteristic, and for applying said waveform to the motor,

(b) a power module having an output electrically connected to the output module, said power module including a rectifier for converting an alternating voltage input substantially into a direct voltage output, said rectifier having means for controlling the amplitude of said direct voltage output in response to said firing signal, wherein said output waveform's characteristic is dependent on the amplitude of said direct voltage output;

(c) control means including a first circuit having means for switching resistance into and out of the control means depending on the amplitude of said direct voltage output, and a second circuit having an output electrically connected to the voltage controlling means of the power module for varying the firing signal in association with the



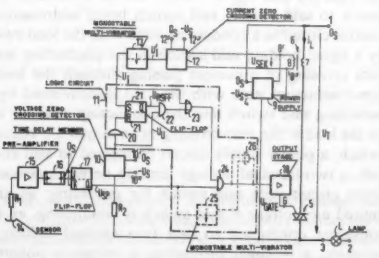
changes in resistance of the first circuit, said first circuit being electrically connected between an output of said power module and an input of said second circuit; whereby said output module, being responsive to the control means, provides an output waveform which increases with frequency from a non-zero value gradually up to a break point and more rapidly beyond the break point, and

(d) wherein the first circuit of the control means comprises a parallel arrangement of a resistor and a diode, said parallel arrangement being connected in series between the direct current output of said power module and said second circuit of said control means.

4,334,183
ELECTRONIC SENSOR ON/OFF SWITCH

Alfred Hauenstein, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 21, 1980, Ser. No. 151,958
Claims priority, application Fed. Rep. of Germany, May 31, 1979, 2922219
Int. Cl.³ G05F *1/45*; H03K *17/72*
U.S. Cl. 323—235 **13 Claims**



1. Electronic sensor on/off switch for a load connected to an a-c supply network, comprising a controlled semiconductor switch connected in a series circuit with the load, a sensor for switching the load on and off, a control circuit connected from said sensor to said switch, said switch being addressable by said control circuit in a conducting state with the load switched on by a signal holding said switch in the conducting state at the zero crossing of a current passing through the load, and in a non-conducting state with the load disconnected by a signal switching said switch into the conducting state for switching

on the load at the zero crossing of an output a-c voltage at said switch, a power supply circuit connected to said control circuit, a current transformer having a primary and a secondary winding and being operable in saturation, said current transformer being connected in series with said switch, said control circuit including a first rectifier being coupled to said secondary winding and having an output producing a supply voltage with said switch in the conducting state relative to a reference potential equal to a reference potential point of the output a-c voltage, and a branch of said series circuit including said primary winding, said switch, a storage capacitor chargeable by the output a-c voltage and a second rectifier producing the supply voltage in the non-conducting state.

4,334,184

ELECTRONIC SENSOR ON/OFF SWITCH

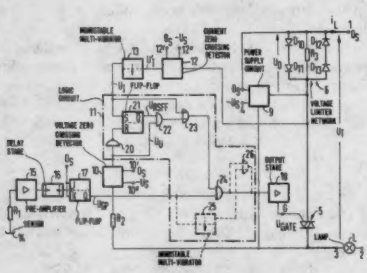
Alfred Hauenstein, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 21, 1980, Ser. No. 152,047

Claims priority, application Fed. Rep. of Germany, May 31, 1979, 2922309

Int. Cl.³ H03K *17/72*; G05F *1/45*

U.S. Cl. 323—235 **16 Claims**



1. Electronic sensor on/off switch for a load connected to an a-c supply network, comprising a controlled semiconductor switch connected in series with the load, a sensor for switching the load on and off, a control circuit connected from said sensor to said switch, said switch being addressable by said control circuit in a conducting state with the load switched on by a signal holding said switch in the conducting state at the zero crossing of a current passing through the load, and in non-conducting state with the load disconnected by a signal switching said switch into the conducting state for switching on the load at the zero crossing of an output a-c voltage at said switch, a power supply circuit connected to said control circuit, a two-terminal voltage limiting network connected in a series circuit with said switch for generating an amplitude-limited a-c voltage if said switch is conducting, an inductive converter conducted to said two-terminal voltage limiting network, a terminal producing a reference potential point connected to said two-terminal voltage limiting network, a storage capacitor connected to said inductive converter for producing a supply voltage for said control circuit relative to the reference potential point, a branch connected to said series circuit of said two-terminal voltage limiting network and said switch including said storage capacitor and a rectifier, and another terminal connected between said storage capacitor and said rectifier for producing the supply voltage in the non-conducting state of said switch, said storage capacitor being charged by the output a-c voltage when said switch is in the non-conducting state.

4,334,185

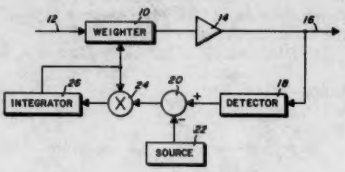
CIRCUIT FOR AUTOMATIC GAIN CONTROL WITH CONSTANT RESPONSE TIME

William J. Turney, Schaumburg, Ill., and Gregory H. Piesinger, Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 18, 1980, Ser. No. 217,956

Int. Cl.³ G05F *1/44*

U.S. Cl. 323—280 **5 Claims**



1. A circuit for automatic control of gain between an input terminal and an output terminal of a system having a continuous a-c signal at the input terminal, the circuit comprising:

a weighter connected to the input terminal and receiving the continuous a-c signal therefrom, the weighter attenuating the continuous a-c input signal by a controlled amount;

an amplifier connected to the weighter and to the output terminal and receiving from the weighter a signal that is amplified and delivered as an output signal to the output terminal;

a detector connected to the output terminal and responsive to a measure of amplitude of the output signal to generate therefrom a detected signal;

a controllable source of a predetermined reference electrical quantity;

a comparator connected to the detector and the controllable source to produce an output that is the difference between the reference electrical quantity and the detected signal;

a multiplier connected to the comparator and receiving as a first input the comparator difference output; and

an integrator connected to the multiplier and the weighter, the integrator receiving as an input an output signal from the multiplier, the integrator producing an integrated output signal that is taken as a second input to the multiplier and as a control signal to the weighter to determine the controlled amount of attenuation of the weighter.

4,334,186

APPARATUS FOR DRIVING HOT-WIRE TYPE FLOW SENSOR

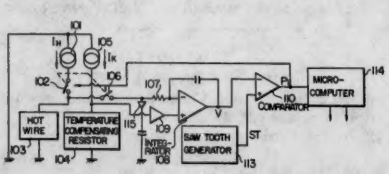
Takao Sasayama, and Shinichi Sakamoto, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 2, 1980, Ser. No. 192,994

Claims priority, application Japan, Oct. 3, 1979, 54-126786; Oct. 3, 1979, 54-126789

Int. Cl.³ F02M *51/00*

U.S. Cl. 323—365 **12 Claims**



1. An apparatus for driving a hot-wire type air-flow sensor, comprising a hot wire disposed so as to radiate heat into an air flow; a temperature sensitive compensating element for temperature compensation; constant current supply sources for

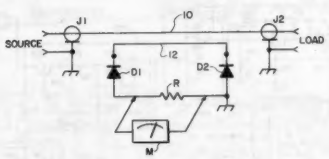
supplying constant currents to said hot wire and said temperature sensitive compensating element, respectively; electronic switch means for interrupting the constant current supplied to said hot wire from said constant current supply source; sample and hold means for sampling and holding a terminal voltage appearing across said hot wire when said constant current is being supplied thereto; integrating means for integrating a difference voltage between a terminal voltage produced across said temperature sensitive compensating element and the output voltage from said sample and hold means; and duty ratio determining means adapted to produce a train of pulses having a pulse width corresponding to the output voltage of said integrating means, wherein said electronic switch means are controlled by the pulse train produced from said duty ratio determining means.

4,334,187

PHASE SENSOR FOR R.F. TRANSMISSION LINES

Charles M. DeSantis, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 11, 1980, Ser. No. 186,109
Int. Cl.³ G01R *27/04*
U.S. Cl. 324—58 R **2 Claims**



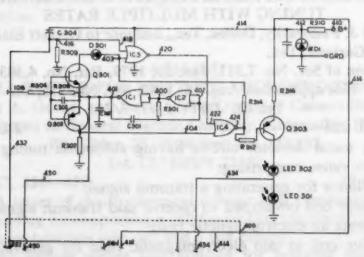
1. A phase sensor circuit comprising a transmission line coupler having an inner conductor and outer conductor means, a short pick-up wire mounted adjacent and parallel to the inner conductor, two diodes with like electrodes connected to opposite ends of the pick-up wire, and a resistor connected between the other electrodes of the two diodes, so that a meter connected across the resistor indicates the phase condition of an R.F. signal on the transmission line.

4,334,188

VOLTAGE DETECTOR USING AN OSCILLATOR AND COMPARATOR MEANS

Carl K. Dudley, Petersburg, Mich., assignor to Eltra Corporation, Toledo, Ohio

Filed Feb. 6, 1980, Ser. No. 118,943
Int. Cl.³ H04B *1/02*; G01R *31/02*; G08B *21/00*; H03K *5/153*
U.S. Cl. 324—133 **4 Claims**



1. Apparatus for detecting the presence of a voltage upon an input lead of said apparatus which is either electrically open or connected to a voltage source, comprising:

oscillator means for providing a time-varying voltage signal;

comparison means for comparing said time-varying voltage signal and the voltage upon said input lead and providing an output signal upon detecting a difference in voltage between said time-varying voltage and the voltage upon said input lead;

said oscillator means being electrically connected to said comparison means and to said input lead;

said comparison means producing a first output when said voltage on said input lead has a positive polarity and said comparison means producing a second output when said voltage on said input lead has a negative polarity;

a warning device;

means for operating said warning device in response to said output signal of said comparison means;

latching means interposed between said warning device and said comparison means for causing said warning device to provide a continued warning after said comparison means has first detected said difference in voltage;

said comparison means including a first transistor having a first polarity and a second transistor having a second polarity;

a first terminal of said first transistor and a first terminal of said second transistor being electrically interconnected at a first point and connected to said input lead;

a second terminal of said first transistor and a second terminal of said second transistor being electrically interconnected at a second point, a resistor being connected between said first point and second point;

said second point being operably connected to said oscillator means;

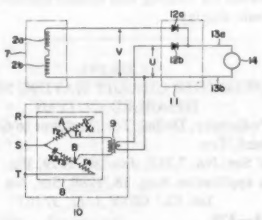
current flowing through said resistor in a first direction turning said first transistor on, and current flow through said resistor in a second direction turning said second transistor on.

4,334,189

OPERATION SUPERVISORY APPARATUS OF CANNED MOTOR

Tetsuya Sato, No. 4-34, Hirano, Shingu-Cho, Ibo-Gun, Hyogo Pref., Japan

Filed Nov. 29, 1979, Ser. No. 98,399
Claims priority, application Japan, Dec. 8, 1978, 53/152947
Int. Cl.³ G01R *31/02, 31/06*; G08B *21/00*
U.S. Cl. 324—158 MG **4 Claims**



1. An operation supervisory apparatus of a canned motor comprising: a first detection means electrically connected to a plurality of detection coils disposed in a stator core of a canned motor and detecting mechanically abnormal operation and electrically abnormal operation of said canned motor by means of a combined value of higher harmonic wave voltages induced in said coils; a second detection means disposed in said canned motor and detecting the rotating direction of said canned motor; a combining circuit combining an output signal from said first detection means and an output signal from said second detection means and taking out the greater output signal of the two; and an indicator displaying an output signal from said combining circuit; said first and second detection means being so arranged that the output signal of said second detection means at the time of reverse rotation of said canned

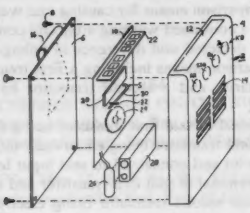
motor is set to a value greater than the output signal thereof at the time of normal rotation and than the output signal of said first detection means within the range of normal operation of said canned motor.

4,334,190

ELECTRONIC SPEED MEASURING DEVICE PARTICULARLY USEFUL AS A JOGGING COMPUTER

Aviezer Sochaczevski, 5723 Palmer Ave., Montreal, Canada

Filed Aug. 1, 1980, Ser. No. 174,672
Int. Cl.³ G01P *3/48, 3/54*
U.S. Cl. 324—171 **14 Claims**



1. An electronic device for measuring distance traversed by a body in motion per unit time, comprising:

A. a housing;

B. presetting means carried by said housing for presetting a distance constant corresponding to the distance per increment of the motion;

C. a sensor carried by said housing for sensing each increment of motion and outputting a sensor signal therefor;

D. an electronic display carried by said housing; and

E. an electronic data processor disposed within said housing and including:

(1) a central clock measuring time in a real-time manner,

(2) means for storing said preset distance constant,

(3) means including said central clock for computing the time intervals between successive sensor signals,

(4) means for computing measurements of speed by multiplying said latter time intervals by the stored distance constant

(5) and means for feeding said measurements of speed to said electronic display.

4,334,191

METAL DETECTOR CIRCUIT HAVING MOMENTARY DISABLED OUTPUT

Robert J. Podhrasky, Dallas, Tex., assignor to Garrett Electronics, Garland, Tex.

Division of Ser. No. 7,311, Jan. 29, 1979, Pat. No. 4,303,879. This application Aug. 18, 1980, Ser. No. 178,737
Int. Cl.³ G01V *3/11, 3/165*
U.S. Cl. 324—329 **2 Claims**

1. A metal detector circuit having momentary disabled audio output, comprising:

an oscillator for generating a transmit signal,

a transmit coil connected to receive said transmit signal and generate an electromagnetic field,

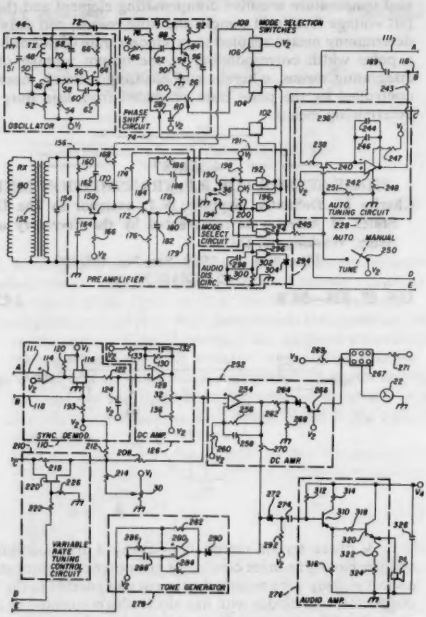
a receive coil positioned in said field for producing a received signal derived from said electromagnetic field,

a synchronous demodulator connected to receive said transmit signal and said received signal for producing an output signal,

a phase shift means connected to receive either said transmit signal or said received signal and connected to said synchronous demodulator for providing a first relative phase shift between said transmit signal and said received signal for a ground cancellation mode of operation or for providing a second relative phase shift between said transmit signal and said received signal for a discrimination mode of operation,

switch means connected to said phase shift means for controlling said phase shift means to provide said first or said second relative phase shift between said transmit signal and said received signal,

an audio signal generator circuit connected to receive said



output signal from said synchronous demodulator for generating an audio signal in response to said output signal to indicate detection of an object by said metal detector circuit, and

means connected to said switch means and to said audio signal generator circuit for inhibiting said audio signal for a predetermined time period immediately after said switch means is operated to select one of said modes of operation.

4,334,192

METAL DETECTOR CIRCUIT HAVING AUTOMATIC TUNING WITH MULTIPLE RATES

Robert J. Podhrasky, Dallas, Tex., assignor to Garrett Electronics, Garland, Tex.

Division of Ser. No. 7,311, Jan. 29, 1979, Pat. No. 4,303,879. This application Aug. 18, 1980, Ser. No. 178,738
Int. Cl.³ G01V *3/11, 3/165*
U.S. Cl. 324—329 **2 Claims**

1. A metal detector circuit having automatic tuning with multiple rates, comprising:

an oscillator for generating a transmit signal;

a transmit coil connected to receive said transmit signal and generate an electromagnetic field;

a receive coil in said electromagnetic field for generating a receive signal therefrom;

phase shift means connected to receive said transmit signal or said receive signal for providing a first or a second relative phase shift therebetween;

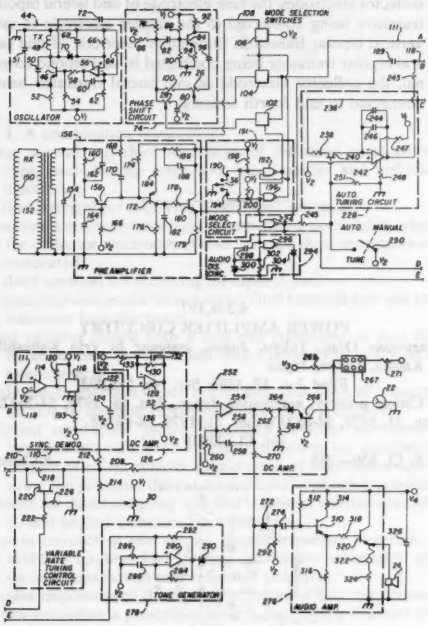
first switch means connected to said phase shift means and having first and second positions for respectively selecting

said first or said second relative phase shift between said transmit and said receive signals;

a synchronous demodulator connected to receive said transmit and receive signals after provision of said first or said second relative phase shift therebetween, said synchronous demodulator generating an output signal to indicate detection of an object within said electromagnetic field;

means for generating a tuning signal which corresponds to a selected state of said output signal;

second switch means for selecting a first or a second automatic tuning mode; and



automatic tuning means connected to said first switch means and to said second switch means, connected to receive said output signal, and connected to the input or output of said synchronous detector for driving said output signal toward said selected state at a first slew rate when said second switch means is set for said first automatic tuning mode and for driving said output signal toward said selected state at a second slew rate, faster than said first slew rate, when said first switch means is engaged in said first or said second position.

4,334,193

CELL TESTER FOR USE WITH MICROPROCESSOR

Lester A. Gordy, and David A. Poff, both of Gainesville, Fla., assignors to General Electric Company, Gainesville, Fla.

Filed Mar. 25, 1980, Ser. No. 133,802

Int. Cl.³ G01N *27/42*

U.S. Cl. 324—437 **12 Claims**

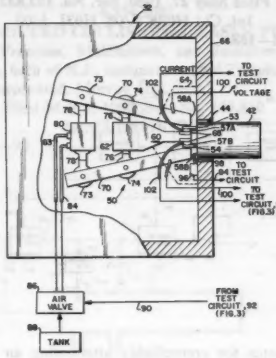
1. A tester of electrochemical storage cells comprising:

a housing for supporting a cell for making electrical connections between said cell and a test circuit;

a mechanism within said housing for bringing electrical contacts in contact with terminals of said cell;

said electrical contacts having separate wires connected thereto for the measurement of voltage and the application of current to a terminal of said cell; and wherein

said mechanism comprises a pair of arms pivoting in the manner of jaws to force the members of a Kelvin contact against a terminal of said cell, said mechanism including a stationary frame positioned between said arms, one member in each of a pair of Kelvin contacts being secured to



said stationary frame while the other members in said pair of Kelvin contacts are secured to said arms whereby the terminals of said cell can be engaged by a single pivoting of said arms relative to each other.

4,334,194

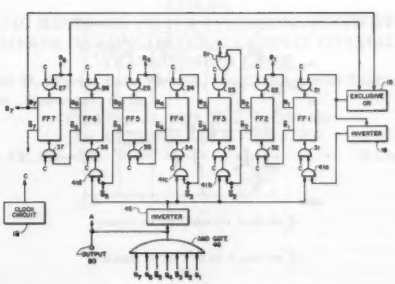
PULSE TRAIN GENERATOR OF PREDETERMINED PULSE RATE USING FEEDBACK SHIFT REGISTER

Otto E. Rittenbach, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 973,642, Dec. 26, 1978, Pat. No. 4,237,464. This application May 9, 1980, Ser. No. 148,324

Int. Cl.³ H03K *21/34, 21/06*

U.S. Cl. 328—42 **6 Claims**



1. A pulse train generator comprising a feedback shift register having a plurality of cascaded clocked bistable stages each having complementary first and second output circuits and associated first and second input circuits, said generator producing an output pulse for each m clock pulses and having a pulse repetition rate greater than $r/(2^n-1)$ where n is the number of binary stages and r is the clock rate,

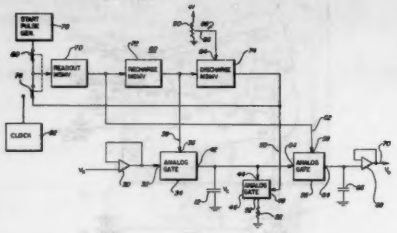
said shift register having a discrete sequence of ONEs and ZEROs appearing in successive first output circuits upon arrival of each $(m-1)$th clock pulse, and

logic gating means for converting said discrete sequence to ONEs in all of said first output circuits upon arrival of each mth clock pulse.

4,334,195
VOLTAGE CONTROLLED ATTENUATOR

David A. Luce, Clarence Center, N.Y., assignor to Norlin Industries, Inc., White Plains, N.Y.

Filed May 27, 1980, Ser. No. 153,832
Int. Cl.[3] H03K 5/08; H03L 5/00
U.S. Cl. 328—168 15 Claims

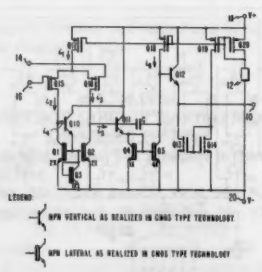


1. Apparatus for controllably attenuating an input signal voltage comprising:
- capacitive means;
- means for discharging said capacitive means;
- switch means operable for alternately coupling said capacitive means to said input signal voltage and to said discharge means for first and second predetermined time intervals respectively; and
- output means for sampling the voltage developed by said capacitive means following each of said second predetermined time intervals.

4,334,196
AMPLIFIER USING LATERAL AND VERTICAL TRANSISTORS

Otto H. Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 18, 1980, Ser. No. 131,518
Int. Cl.[3] H03F 3/45
U.S. Cl. 330—253 11 Claims

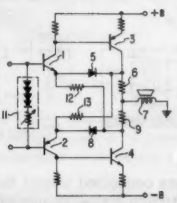


1. In a semiconductor structure having a unitary body of semiconductive material of a first conductivity type, a first plurality of semiconductor regions of a second conductivity type disposed in PN junction forming relation with said semiconductor body, a second plurality of semiconductor regions of the first conductivity type disposed in PN junction forming relation with a number of said plurality of semiconductor regions on the surface thereof remote from said semiconductor body, said first and second plurality of semiconductor regions forming substructures operable as field-effect transistors, forming substructures operable as vertical bipolar transistors of the second conductivity type wherein said semiconductor body serves as the collector region thereof, and forming substructures operable as lateral bipolar transistors of the second conductivity type, an amplifier comprising:
- first and second terminals for receiving an operating potential therebetween, said first terminal being connected to said semiconductor body;
- a third terminal for receiving an input signal;
- a fourth terminal for providing output signal;
- a vertical bipolar transistor having respective emitter, base, and collector electrodes, the base electrode of said vertical bipolar transistor being connected to said third terminal; and
- a lateral bipolar transistor having respective emitter, base and collector electrodes, the base electrode of said lateral bipolar transistor being connected to the emitter electrode of said vertical bipolar transistor, the emitter electrode of said lateral bipolar transistor being connected to said second terminal, the collector electrode of said lateral transistor being connected to said fourth terminal.

4,334,197
POWER AMPLIFIER CIRCUITRY

Kazumasa Otao, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 12, 1980, Ser. No. 158,893
Claims priority, application Japan, Jun. 18, 1979, 54-76423; Jun. 21, 1979, 54-85217; Jun. 21, 1979, 54-85218
Int. Cl.[3] H03F 3/30
U.S. Cl. 330—268 5 Claims



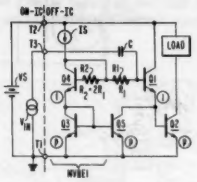
1. A singled-ended, push-pull, power amplifier circuit comprising
- a first inverted Darlington circuit including a first transistor, a second transistor and a first diode connected between the emitter of the first transistor and the collector of the second transistor,
- a load,
- a first resistor,
- the collector of the second transistor being connected to the load through the first resistor,
- a second inverted Darlington circuit including a third transistor, a fourth transistor and a second diode connected between the emitter of the third transistor and the collector of the fourth transistor,
- a second resistor, the collector of the fourth transistor being connected to the load through the second resistor,
- a bias voltage source for applying a bias voltage of fixed value between the bases of the first and the third transistors,
- a third resistor connected between the emitter of the first transistor and the collector of the fourth transistor, and
- a fourth resistor connected between the collector of the second transistor and the emitter of the third transistor.

4,334,198

BIASING OF TRANSISTOR AMPLIFIER CASCADES

Max E. Malchow, Raritan Township, Hunterdon County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 24, 1980, Ser. No. 143,504
Int. Cl.[3] H03F *3/04*
U.S. Cl. 330—296 7 Claims



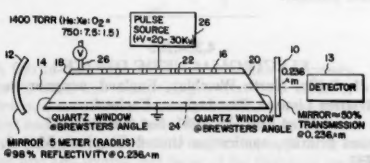
1. A combination comprising:
first, second and third transistors of the same conductivity type, each having respective base, emitter and collector electrodes;
a first terminal for receiving a reference potential;
a second terminal for receiving an operating potential to which the collector electrodes of said first and third transistors are connected;
a third terminal for receiving an input signal;
a capacitor connected between said third terminal and said first transistor base electrode;
first resistive means with a first end connected to said first transistor base electrode and with a second end at a point of interconnection;
galvanic connection means connecting said point of interconnection to the base electrode of said third transistor;
current conductive means connected between said second terminal and said point of interconnection for conducting current of a first polarity to said point of interconnection to draw the potential thereat towards said operating potential;
means for direct coupling said first transistor emitter electrode to said second transistor base electrode;
means connecting said second transistor emitter electrode to said first terminal for referring the emitter potential of said second transistor to said reference potential;
means responsive to the emitter potential of said third transistor exceeding a prescribed level for supplying first and second currents, of a second polarity and with amplitudes proportionally related to each other, to said point of interconnection and to said first transistor emitter electrode; and
first load means to which said second transistor collector electrode is connected, including a path for quiescent current between that electrode and said second terminal.

4,334,199

EXCIMER LASER

David O. Ham, Rochester, N.Y., assignor to The University of Rochester, Rochester, N.Y.

Filed Oct. 27, 1978, Ser. No. 955,292
Int. Cl.[3] H01S *3/22, 3/223*
U.S. Cl. 372—57 18 Claims



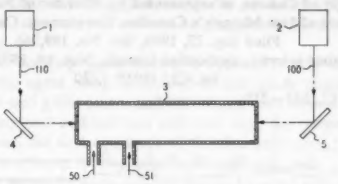
1. In a gas laser, apparatus comprising a chamber containing a mixture of at least three molecular species which produce a polyatomic excimer laser medium in a termolecular reaction when excited to raise at least one of said species to a metastable state, and means coupled to said mixture for exciting said species to said metastable state.

4,334,200

LASER INDUCED COLLISIONAL LASER PUMPING

Richard R. Freeman, Middletown, and Jonathan C. White, Eatontown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 1, 1980, Ser. No. 145,810
Int. Cl.[3] H01S *3/22*
U.S. Cl. 372—90 14 Claims



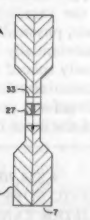
1. An apparatus comprising:
a chamber;
a storage species and a second species disposed in said chamber, said second species being a molecular material;
excitation means for exciting said storage species;
characterized in that said apparatus further includes
a laser source of laser radiation and
means for applying said laser radiation to said storage species and said second species in said chamber, whereby said second species is excited to a higher state by a laser-induced collisional energy transfer interaction between said excited storage species and said second species and said higher state is a dissociative molecular state, whereupon said second species decays into a first and a second fragment.

4,334,201

YIG BANDPASS FILTER INTERCONNECTED BY MEANS OF LONGITUDINALLY SPLIT COAXIAL TRANSMISSION LINES

David H. Shores, Lake Oswego, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 21, 1978, Ser. No. 944,436
Int. Cl.[3] H01P *1/217, 7/06, 1/209*
U.S. Cl. 333—202 6 Claims



1. A magnetic field-tunable filter comprising (a) a nonmagnetic metallic housing; (b) a cavity formed within said housing; (c) a ferrimagnetic resonator element supported within said cavity; (d) a passage leading from said cavity to an external surface of said housing; and (e) a coupling structure including an elongate conductor extending centrally through said pas-

sage into said cavity to couple magnetically with said resonator element;

characterized in that (1) said passage is composed of plural sections of different diameter, including one section of smaller diameter communicating with said cavity, and another section of larger diameter opening into said external surface, and (2) said housing comprises first and second members joined along the longitudinal centerline of said passage.

4,334,202

BROADBAND FREQUENCY DIVIDER

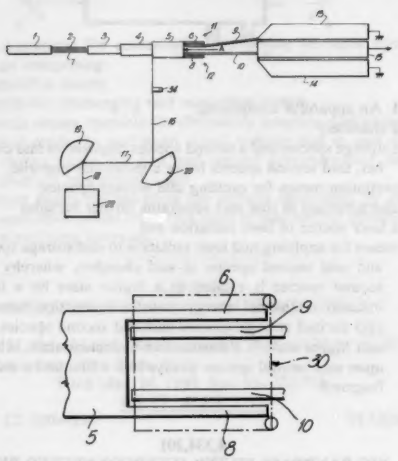
William D. Cornish, Nepean, and François A. Gauthier, Gatineau, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by Minister of National Defence of Her Majesty's Canadian Government, Canada

Filed Sep. 23, 1980, Ser. No. 189,766

Claims priority, application Canada, Nov. 16, 1979, 340023

Int. Cl.³ H01P 1/20

U.S. Cl. 333—218 **4 Claims**



1. In a microwave frequency divider having a circuit resonant at a subharmonic frequency formed by a pair of input microstrip transmission lines and a pair of output microstrip transmission lines, each input line being terminated by a varactor diode, the output lines being connected to a coplanar waveguide balun, a bias supply line having a quarter wavelength section connected to the varactor diodes, the improvement comprising a metal plate, physically isolated from ground and disposed so as to be substantially co-extensive with the resonant circuit and in closely spaced relation thereto, for capacitively loading the resonant circuit and thereby increasing the resonant frequency thereof and providing an improved match for the reactive part of the input impedance.

4,334,203

SECOND HARMONIC SUPPRESSOR FOR POWER AMPLIFIER TANK CIRCUIT

James A. Aurand, Quincy, Ill., assignor to Broadcast Electronics, Inc., Quincy, Ill.

Filed Apr. 9, 1980, Ser. No. 138,668

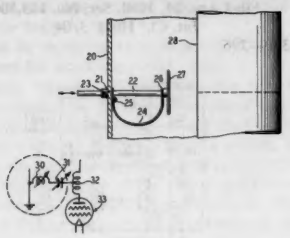
Int. Cl.³ H01P 1/212, 7/04

U.S. Cl. 333—226 **6 Claims**

1. The combination of a power amplifier resonant transmission line having an outer conductor and an inner conductor, and a second harmonic suppressor therefor comprising:

a capacitive plate and an inductive strap;

the inductive strap being mechanically and electrically coupled from the outer conductor to the capacitive plate; and



means for adjusting the position of said capacitive plate with respect to said inner conductor.

4,334,204

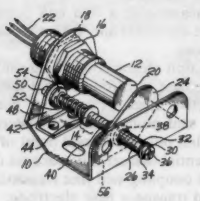
PROXIMITY SWITCH ASSEMBLY

John A. Buchanan, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 30, 1980, Ser. No. 164,718

Int. Cl.³ H01H 36/00

U.S. Cl. 335—205 **1 Claim**



1. A proximity switch assembly comprising:

a base plate;

a sensor mounted to the base plate and producing an output signal in response to a target plate being within a predetermined distance of the pickup portion of said sensor;

a plunger mechanism mounted to the base plate for movement of a plunger with respect thereto in response to a plunger striker surface being forcibly engaged by an external object;

a target plate mounted to the plunger for movement therewith and being positioned with respect to the sensor such that a predetermined movement of said plunger positions the target plate within said predetermined distance of said sensor; and wherein the plunger has a threaded shaft and is mounted to said base plate such that it is free to rotate about its longitudinal axis and the target plate has a provided means for mounting said target plate to ride on said threaded shaft such that the static position of the target plate with respect to the sensor is adjustable by rotating said plunger.

4,334,205

ELECTROMAGNETIC DEVICES

Alec H. Seilly, North Wembley, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Mar. 25, 1981, Ser. No. 247,333

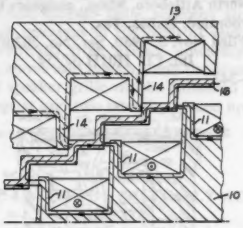
Claims priority, application United Kingdom, May 2, 1980, 8014737

Int. Cl.³ H01F 7/08

U.S. Cl. 335—220 **5 Claims**

1. An electromagnetic device comprising an elongated inner stator structure which defines a plurality of axially spaced

annular magnetisable pole pieces, said pole pieces having diameters which increases toward one end of the stator structure, a winding carried by the stator structure and which when supplied with electric current causes adjacent pole pieces to assume opposite magnetic polarity, an annular armature surrounding the stator structure said armature being formed from magnetisable material and having a generally tapered inner surface whereby when current is supplied to the winding the armature will move axially towards the one end of the stator structure, an outer stator structure which surrounds the armature, the armature having a generally tapering outer surface, said outer stator structure having a plurality of axially spaced annular magnetisable pole pieces and a winding arranged so that when electric current flows through the winding adjacent pole pieces will assume opposite magnetic polarity, the outer stator structure being axially displaced relative to the inner stator structure whereby the magnetic circuits in the armature for the flux produced by the inner and outer stator structures when the respective windings are energised are displaced relative to each other.



4,334,206

FERRITE CORE TYPE TRANSFORMER

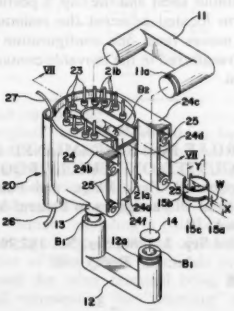
Kenzi Nakamura, Katano, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Aug. 22, 1980, Ser. No. 180,392

Claims priority, application Japan, Aug. 23, 1979, 54-116504[U]; Sep. 17, 1979, 54-119688

Int. Cl.[3] **H01F** *27/30*

U.S. Cl. 336—96 **7 Claims**



1. A ferrite core type transformer which comprises:

a ferrite core unit comprising a first core member having first and second end faces, a second core member having first and second end faces, said first and second core members being positioned with respect to each other such that the first and second end faces of the first core member are aligned with the first and second end faces of said second core member thereby forming a closed magnetic path, and a first bonding agent having a quick hardening property at room temperature, said first bonding agent being applied between the first end faces of the first and second core members, and also between the second end faces of the first and second core members for rigidly connecting the first and second core members together, each of said first and second core members having a U-shaped configuration such that, when the first and second core members have been connected together, said core unit has a generally O-shape;

a coil unit comprising an inner bobbin for supporting a primary winding therearound, said inner bobbin having a bore therein for receiving said ferrite core unit, an outer bobbin for supporting a secondary winding therearound, said outer bobbin being arranged coaxially with said inner bobbin, a casing for housing said inner and outer bobbins therein and including guide means for receiving a portion of said core unit, and a thermosetting plastic filled in said casing;

a second bonding agent having a resiliency, said second bonding agent being positioned in said guide means between said guide means and one of said core members for bonding said coil unit and said core unit, the connection between the first end faces of the first and second core members being located outside the coil unit; and

a holder means for engaging said first and second core members and holding the first and second core members together at the area of connection between the first end faces of the first and second core members.

4,334,207

LINEAR DISPLACEMENT TRANSDUCER

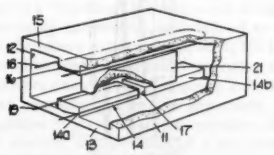
Colin S. Bill, Birmingham; Charles P. Cockshott, Coventry, and John H. Francis, Birmingham, all of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Jun. 22, 1979, Ser. No. 51,243

Claims priority, application United Kingdom, Jun. 28, 1978, 28176/78; Dec. 2, 1978, 46993/78; Mar. 1, 1979, 797245

Int. Cl.[3] **H01F** *21/06*

U.S. Cl. 336—136 **13 Claims**



1. A linear displacement transducer including a first elongated magnetizable member having first and second pole pieces which extend parallel with each other over the full length of said first member, and which are of substantially constant width along their length, a first winding wound around part but not all of said first member, a second winding wound around the full length of the first member, and a second elongated member having at least a part which is shorter than said first elongate member, said first and second members being movable linearly relative to each other in a direction parallel with the longitudinal axis of the first member, while maintaining a substantially constant gap between the members, to vary the magnetic coupling between said first and second windings when an a.c. signal is applied, in use, to one of the windings.

4,334,208

COIL FORMER FOR A TRANSFORMER

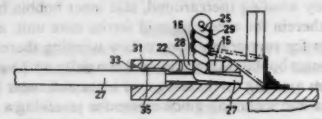
Sieghard Post, Guntersdorf, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 2, 1980, Ser. No. 193,210

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1979, 2941756

Int. Cl.³ H01F *15/10*

U.S. Cl. 336—192 8 Claims



1. A coil former comprising a support member adapted to support a coil wire having coil wire ends, said support member including at least one connection strip member, connection pins being formed from twisted loops of connection wires, the connection strip member including duct-like inlet paths therein through which the connection wires pass and a pick-up recess which communicates with the inlet paths so that a connection wire in each inlet path can be picked up and pulled out of the pick-up recess and twisted to form said twisted loop connection pins, the twisted loop extending through the pick-up recess substantially at right angles to non-twisted portions of the connection wire positioned in the inlet path on each side of the recess, said connection strip member located at an area where the ends of connection wires and the coil wire ends are adapted to be interconnected by means of said connection pins.

4,334,209

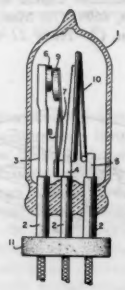
GLASS ENCLOSED THREE LEAD CIRCUIT BREAKER

Philip J. Dennis, Cape Elizabeth, Me., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 36,196, May 4, 1979. This application Nov. 21, 1980, Ser. No. 209,342

Int. Cl.³ H01H *45/02, 61/02*

U.S. Cl. 337—112 2 Claims



1. A circuit breaker comprising: a hermetically sealed glass envelope; three spaced apart metal tubes sealed to one end of said envelope, said metal tubes being readily sealable to glass, a metal lead-in wire disposed within each of said metal tubes and being hermetically joined thereto and extending beyond the ends thereof; a stationary contact within the envelope attached to a first one of the lead-in wires; a theremostatic metallic element having a movable contact at one end thereof within the envelope attached to the second of the lead-in wires; a heater within the envelope isolated from said first lead-in wire and attached between said second lead-in wire and the third of the lead-in wires, the heater being in series with the thermostatic metallic element and being in heat radiating proximity thereto; the contact during normal operation being closed, the heater being operative to open the contact when starting current flows through the heater longer than a predetermined time, the thermostatic metallic element being operative to open the contacts when more than a predetermined amount of current flows through the thermostatic metallic element.

4,334,210

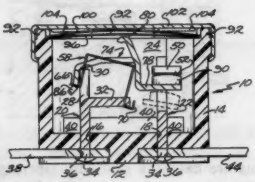
THERMOSTATIC SWITCH AND METHOD OF MAKING

Henry J. Boulanger, Cumberland, R.I., and Andrew C. McGuirk, North Attleboro, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 3, 1980, Ser. No. 203,071

Int. Cl.³ H01H *37/54*

U.S. Cl. 337—343 7 Claims



1. An electrical switch comprising a housing defining a switch cavity therein, the housing having a bottom wall and a generally cylindrical side wall depending from the bottom wall and terminating at a distal free end, movable and stationary contacts disposed in the switch cavity, a movable contact arm mounting the movable contact and adapted to move the movable contact into and out of engagement with the stationary contact, a ledge formed at the free distal end of the side wall, a plurality of plateaus extending from the ledge and spaced around the periphery of the side wall, a thin, generally circular sheet of flexible resinous film lying in a plane having a plurality of outwardly extending tab portions disposed on the ledge with the tabs received between the plateaus, the tabs bent out of the plane of the sheet, a thermally conductive cap received over the distal free end of the side wall and a thermally responsive disc movable from one configuration to another configuration upon the occurrence of a preselected temperature disposed between the resinous sheet and the cap, a portion of the movable contact arm located adjacent the resinous film so that when the disc moves from one configuration to another its motion will be transferred to the movable contact arm through the resinous film.

4,334,211

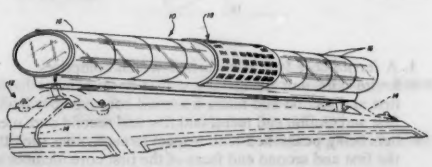
SPEAKER GRILLE FOR STREAMLINED LIGHT BAR MOUNTED ON VEHICLE ROOF

Michael V. McConnell, Park Ridge, and Paul D. Graham, Frankfort, both of Ill., assignors to Federal Signal Corporation, Oak Brook, Ill.

Filed Sep. 2, 1980, Ser. No. 182,995

Int. Cl.³ B60Q *1/00*

U.S. Cl. 340—88 8 Claims



1. In a combination light/siren assembly of a type to be mounted across the roof of an emergency vehicle and having an elongated housing which extends across the vehicle roof in

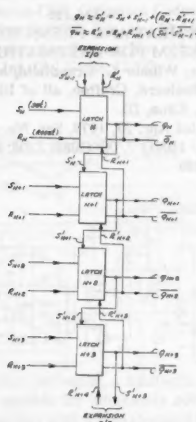
spaced relation thereto, including warning lights mounted in said housing, and a siren speaker located in said housing, the improvement comprising, a speaker grille incorporated into said housing forwardly of said siren speaker and formed with a leading portion which divides oncoming air into separate streams which flow above and below said grille, said speaker grille having a plurality of small openings formed therein for emitting sound waves from said siren speaker, said openings being provided in a non-linear profile in an upper portion of said speaker grille so as to extend to a greater height in two laterally spaced outer side areas and to a lesser height in a central area of said speaker grille, whereby air entering said housing through openings in the front of said grille will be substantially restricted from exiting upwardly into the air stream flowing above said housing, and the acoustical characteristics of said speaker grille will be enhanced by the higher level of openings at said two laterally spaced upper side areas of said grille.

4,334,212

ELECTRONIC LATCH FOR DIGITALLY ACTUATING A LOAD

Fred R. Wright, 3620 Bluff Pl. #2, San Pedro, Calif. 90731

Filed Sep. 21, 1979, Ser. No. 77,599
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 DA **7 Claims**



1. A data latch comprising

a bistable "logical" latching element, n, having a pair of input terminals coupled to be responsive to an individual triggering signal for "setting" the latching element to a preselected one of its bistable states in response to a triggering signal coupled to either one of said input terminals,

said latching element including a pair of output terminals coupled thereto to signal the state of the bistable latching element, one of the output terminals representing the "setting" and the other terminal being complementary thereto and representing the "resetting" of the latching element,

another pair of input terminals coupled to said latching element and coupled to be responsive to an individual triggering signal for "resetting" the latching element to the other one of the bistable states in response to a triggering signal coupled to either one of the another pair of input terminals,

a plurality of bistable "logical" latching elements constructed and defined as the first mentioned latching element n with the same two pairs of input terminals and the pair of output terminals,

the plurality of latching elements being arranged in sequence on the opposite sides of the n latching element and being respectively identified as n−1, n−2, etc. and n+1, n+2, etc., elements,

circuit means coupled to the "setting" one of the output terminals of the first mentioned n latching element to one of the "setting" input terminals for the n+1 latching element,

circuit means coupled to the "resetting" one of the output terminals of the first mentioned, n, latching element to one of the "resetting" input terminals for the n−1 latching element,

circuit means coupled to the "setting" one of the output terminals of the n−1 latching element to one of the "setting" input terminals for the n latching element,

circuit means coupled to a "setting" one of the input terminals of the n−1 latching element adapted to be connected to one of the terminals for a source of reference potential or the n−2 "setting" output terminal,

circuit means coupled to the "resetting" one of the output terminals of the n+1 latching element to one of the "resetting" input terminals for the n latching element,

circuit means coupled to a "resetting" one of the input terminals for the n+1 latching element adapted to be connected to one of the terminals for a source of reference potential or the n+2 "resetting" output terminal,

individual latching selection elements, the number of selection elements being one greater than the number of said latching elements, each selection element being coupled to a source of potential for applying a preselected potential to at least a single latching element when in the static condition and a triggering signal to at least one of the latching elements when selectively operated,

circuit means coupling an individual latching selection element to a "resetting" input terminal of the last of said n+1 series of elements for resetting all of the latching elements to signal the binary pattern 0000—when selectively operated,

circuit means for coupling an individual latching selection element to a "setting" input terminal of the last of said n−1 series of elements for setting all of the latching elements to signal the binary pattern 1111—when selectively operated,

individual circuit means for coupling an individual latching selection element to a "resetting" input terminal of the n latch and to a "setting" input terminal of the n+1 latch,

individual circuit means for coupling an individual latching selection element to a "setting" input terminal of the n latch and to a "resetting" input terminal of the n−1 latch,

the latches being constructed and defined to sequentially produce the binary patterns 0000, 0001, 0011, 0111, 1111 and vice-versa when sequentially operating the selection elements from one end to the opposite end, the operation is further characterized by the generation of a unique binary pattern in response to the operation of a selection element whereby the operation of a selection element to "set" the coupled latch to a binary 1 will cause all latches arranged in ascending order to be set to a binary 1 and when a selection element is operated to "reset" a latch to a binary 0 will cause all latches arranged in decending order to be reset to a binary 0.

4,334,213

CIRCUIT FOR ADDRESSING BINARILY ADDRESSABLE MEMORIES WITH BCD ADDRESSES

Hanan Potash, La Jolla, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 4, 1980, Ser. No. 118,490
Int. Cl.³ H03K *13/24*; G06F *5/02*
U.S. Cl. 340—347 DD **6 Claims**

1. The combination of a digital system means for providing electrical signals encoded as any number of BCD digits greater than three, a memory means that is addressable with electrical signals encoded as a binary address, and a means for generating

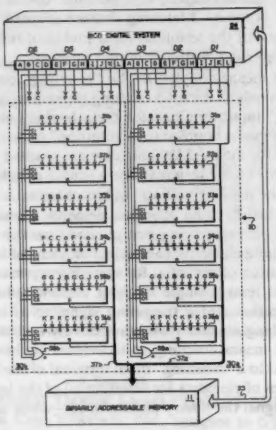
said electrical signals that address said memory means from said electrical signals provided by said digital system means;

said generating means being comprised of:

a plurality of identical circuit modules, the number of modules in said plurality being at least one-third the number of BCD digits encoded into said electrical signals from said digital system;

each of said modules having inputs coupled to receive a respective subset of said electrical signals from said digital system, said subset of electrical signals encoding up to three BCD digits;

each of said modules including a means for forming electrical output signals as a permutation of:



(a) those electrical signals in said subset that represent the three least significant bits of each BCD digit having a most significant bit of "0",

(b) those electrical signals in said subset that represent the single least significant bit in each BCD digit having a most significant bit of "1", and

(c) encoded digital "1" and "0" signals that represent the most significant bits of all of the BCD digits encoded into all of the electrical signals in said subset; and

means for addressing said memory by concatinating together said electrical output signals from all of said modules as a single binary address.

4,334,214

WARNING APPARATUS USING MICROWAVES

Shun Satou, and Yuuji Jitsumatsu, both of Omiya, Japan, assignors to Yagi Antenna Co., Ltd., Tokyo, Japan

Filed Jun. 18, 1980, Ser. No. 160,495

Int. Cl.³ G08B *13/18*; G08G *1/01*

U.S. Cl. 340—552 **6 Claims**

1. A warning apparatus using microwaves comprising:

drive means generating a rectangular pulse voltage;

means for oscillating a microwave in accordance with the rectangular pulse voltage generated from said drive means;

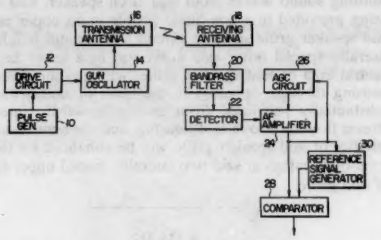
a transmission antenna having a first rectangular slotted waveguide and a horn which are arranged in a horizontal plane, for radiating in accordance with the microwave from said oscillating means a fan beam whose width is broad in a vertical plane;

a receiving antenna having a second rectangular slotted waveguide and a horn;

means for detecting a microwave with a given frequency band received by said receiving antenna;

an automatic gain control circuit connected to said detecting means and having a given time constant to control a gain of said detecting means;

reference signal generating means having a time constant the same as the time constant of said automatic gain control circuit and generating a reference signal according to the output signal of said detecting means; and



means for comparing the output signals of said detecting means and reference signal generating means to produce a detecting signal when both signals coincide with each other.

4,334,215

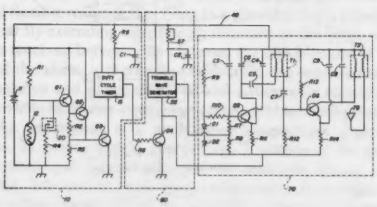
CONTINUOUS HEAT AND PRESSURE SURVEILLANCE SYSTEM FOR PNEUMATIC TIRES

John D. Frazier; Wilmur G. Grandfield, both of Godfrey, and Michael G. Brainerd, Grafton, all of Ill., assignors to Tire-Tronics, Inc., Alton, Ill.

Filed Apr. 27, 1979, Ser. No. 34,427

Int. Cl.³ H04Q *7/00*; G08B *1/08*; B60C *23/00*

U.S. Cl. 340—539 **1 Claim**



1. Apparatus mountable within a pneumatic tire of a motor vehicle for signaling to a receiver remote from such tire the increase of tire temperature above a selected normal and the deviation of tire pressure from a selected normal range, comprising

a radio transmitter,

a battery of the type which does not degrade substantially up to such selected normal tire temperature, and

means for making a circuit between said battery and transmitter including

pressure-sensing switch means to close upon deviation of tire pressure from such selected pressure range, and

temperature-sensing switch circuitry having a switching state controlled by a transistor, the transistor having

control electrode means to switch the transmitter from off to on in response to decrease of bias potential applied to said electrode, said circuitry further having

a voltage divider network comprising a series circuit including

(A) a substantially fixed resistance connected at one end to one terminal of the battery and

(B) a negative temperature coefficient thermistor connected at one end to the other terminal of the battery,

said resistance and said thermistor being connected together

at their opposite ends to form a circuit node therebetween, said transistor control electrode being connected to said node,

said thermistor being characterized by having such high resistance at such selected normal tire temperature as to be substantially nonconducting, and by having such decreased resistance at substantially greater temperatures as to become substantially conducting,

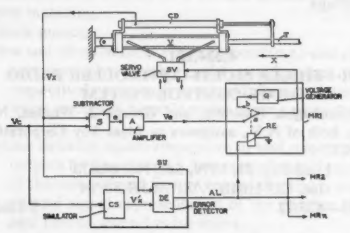
whereby at and below such selected normal tire temperature, the high resistance of the thermistor will both substantially avoid current flow through the network and maintain such a bias potential on the transistor as to avoid actuating the transmitter.

4,334,216

ELECTRONIC DEVICE FOR MONITORING THE OPERATION OF A SERVO SYSTEM INCLUDING A HYDRAULIC JACK

Michel A. B. Lacroix, Velizy, France, assignor to Le Materiel Telephonique Thomson-CSF, Colombes Cedex, France

Filed Nov. 8, 1979, Ser. No. 92,548
Claims priority, application France, Nov. 22, 1978, 78 32904
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—679 **5 Claims**



1. In a servo system including a hydraulic jack provided with a servo valve settable for alternately advancing and retracting said jack together with a load engaged thereby, actuating means for setting said servo valve in response to the difference between an externally generated position-control signal and a position-feedback signal from said jack, and monitoring means responsive to deviations between said position-feedback signal and a reference signal derived from said position-control signal for disabling said actuating means upon said deviations falling outside a predetermined tolerance range,

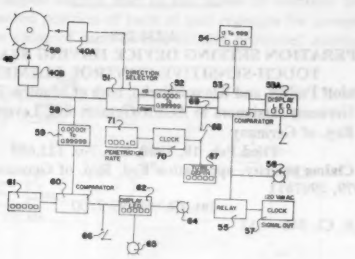
the improvement wherein said monitoring means comprises a simulation circuit receiving said position control signal at its input and supplying said reference signal at its output, said simulation circuit having a transfer function which is a first-order approximation of the transfer function of the combination of said jack and said actuating means, said simulation circuit including an integrating operational amplifier whose time constant substantially equals the response time of said jack, said monitoring means further including an error detector with one input receiving said position-feedback signal from said jack and with another input receiving said reference signal from said simulation circuit and supplying at its output a safety signal which disables said actuating means whenever the signals at its inputs differ by more than a predetermined amount.

4,334,217

ELECTRONIC CONTROL INDICATOR FOR CABLE HOIST EQUIPMENT

Barry J. Nield, Calgary, Canada, and Roy R. Earnshaw, Bakersfield, Calif., assignors to Rig Electronics Ltd., Calgary, Canada

Filed May 2, 1980, Ser. No. 146,327
Int. Cl.³ B66B *3/02*; E21B *45/00*; G06B *3/02*; G08B *19/00*
U.S. Cl. 340—685 **13 Claims**



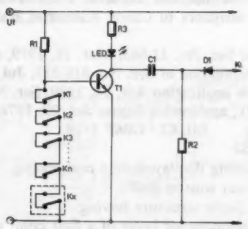
1. Indicating means for cable hoist equipment which includes a cable with load carrying means on the free end thereof movable between an uppermost position and a lowermost position and vice versa and at least one rotating member which rotates in relation to the vertical movement of the load carrying means; comprising in combination a pair of sensors secured in spaced angular relationship with one another adjacent said rotating member, sensor actuating means co-axially mounted on said rotating member and being sensed by said sensors and producing electromagnetic pulses therein, and electronic means operatively connected to said sensors to receive the pulses therefrom, said electronic means including means to receive said pulses, first means to translate said pulses and display same to indicate the total distance up and down travelled by the cable and second means to translate said pulses to indicate the position of the load carrying means relative to a reference point such as the uppermost and lowermost positions.

4,334,218

MOTION SENSING CIRCUIT ESPECIALLY FOR ALARM DEVICES

Akos Kun, Hernad u. 7., 1078 Budapest, Hungary

Filed Oct. 7, 1980, Ser. No. 194,779
Int. Cl.³ G08B *13/02*
U.S. Cl. 340—689 **6 Claims**



1. An alarm apparatus for sensing a predetermined motion of an object under surveillance, comprising an electrical circuit energized by the flow of an electric current, at least one switching device included in said circuit and being of the type having a pair of stable current conducting positions for quiescently conducting said electric current and an unstable tripping or current blocking position for interrupting said electric

current when said predetermined motion of object occurs, means for displaying the occurence of said current blocking position of said switching device as said alarm condition for said object, wherein a plurality of said switching devices are connected in series in said circuit, wherein a differentiating circuit branch is coupled before said display means, said differentiating circuit branch outputting said current blocking position of said switching device in the form of a pulse and, wherein said displaying means comprises a pulse sensing registration device.

4,334,219

OPERATION SETTING DEVICE HAVING STATIONARY TOUCH-SENSITIVE CONTROL ELEMENTS

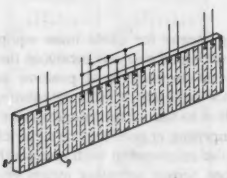
Rüdolf Paülus, and Klaus Mischo, both of Munich, Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Feb. 19, 1980, Ser. No. 122,689

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1979, 2907811

Int. Cl.³ G09G *3/00*

U.S. Cl. 340—712 **10 Claims**



1. An operation setting device having stationary control keys, comprising transparent support means of insulating material defining two opposite faces, said keys including pairs of stationary contact strips made of an electrically conductive material secured to one of said faces; means for interconnecting said contact strips outside said support means to provide for variable groups of key elements; means for releasing a switching function when said contacts in respective pairs are bridged by a lower electric resistance; and an exchangeable visual identification plate arranged opposite the other face of said transparent support means to identify the function of respective control keys.

4,334,220

DISPLAY ARRANGEMENT EMPLOYING A MULTI-ELEMENT LIGHT-EMITTING DIODE

Ryoichi Suzuki, Kawasaki; Takashi Uchiyama, Kanagawa; Kazuya Hosoe, Machida, and Tokuichi Tsunekawa, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 22,643, Mar. 21, 1979, abandoned, which is a continuation of Ser. No. 818,217, Jul. 22, 1977, abandoned. This application Apr. 24, 1980, Ser. No. 143,448

Claims priority, application Japan, Jul. 29, 1976, 51-90737

Int. Cl.³ G06F *3/14*

U.S. Cl. 340—753 **10 Claims**

1. A light-emitting display device comprising:

an electrical power source; and

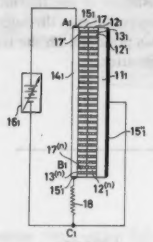
a light-emitting diode structure having:

(a) a first semiconductor layer of a first conductivity type, said layer having first and second faces;

(b) each of a plurality of second semiconductor layers having a conductivity type opposite to that of the first conductivity type being arranged alternately with each of a plurality of insulating layers along the first semiconductor layer to form respective P-N junctions with the first semiconductor layer;

(c) a first electrode arranged in contact with the face of the first semiconductor layer opposite to its face forming P-N junctions for receiving a certain voltage;

(d) a resistor arranged in contact with a face of each of the second semiconductor layers opposite to a face forming said P-N junctions and also in contact with each of said insulating layers, the conductance of the resistor being set relatively larger than the nominal direction conductance of said P-N junctions; and



(e) second and third electrodes for receiving a variable signal voltage connected to said resistor at respective end portions thereof, said end portions being arranged in a direction of the alternate arrangement of the second semiconductor layers with insulating layers,

whereby the light-emitting zone in the direction of the alternating arrangement of the light-emitting diode structure will vary with variation of the potential gradient of the resistor, which variation results from the application of said variable signal voltage.

4,334,221

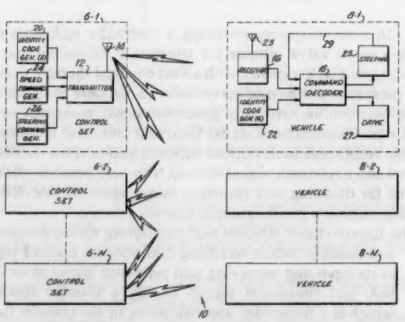
MULTI-VEHICLE MULTI-CONTROLLER RADIO REMOTE CONTROL SYSTEM

William Rosenhagen, Ossining, and George J. Whalen, New Rochelle, both of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed Oct. 22, 1979, Ser. No. 86,873

Int. Cl.³ H04B *7/00*; A63H *30/04*

U.S. Cl. 340—825.72 **8 Claims**



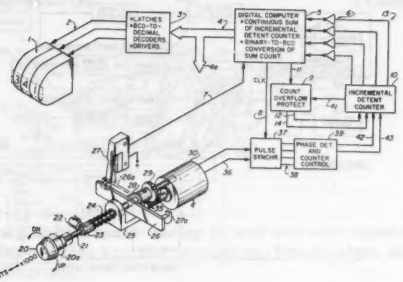
1. In a vehicle radio control system of the type having at least one control set to transmit command signals for commanding the operation of at least two functions of a vehicle, said vehicle including means for receiving the transmitted command signals to derive at least first and second function control signals and a brake control signal therefrom, said first and second function control signals causing first and second opposite functions to be performed and said brake control signal being selectively derived to inhibit either function from being performed; and gating means for gating one and only one

function control signal so as to prevent both of said functions from being performed concurrently.

4,334,222
OPTICAL SELECTOR SWITCH AND DISPLAY APPARATUS

Michael R. Kelley; Jack E. Emfinger, both of Phoenix, and Michael A. Dassele, Scottsdale, all of Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Mar. 14, 1980, Ser. No. 130,310
Int. Cl.³ G08C *19/36, 19/16*
U.S. Cl. 340—870.29 **11 Claims**



1. Angle repeater means adapted for use with angular position pick-off means producing first and second pulse trains upon rotation thereof through an integral number of complete revolutions in a first or in a second direction, said repeater means including:

clock means,

first and secon bistable means responsive to said clock means cooperatively forming pulse synchronizer means and respectively responsive to said first and second pulse trains, each said bistable means having respective Q and Q outputs,

phase detector means responsive to said respective Q and Q outputs for generating a first control signal representative of the sense of said first or second directions and a second control signal representative of the number of pulses in said first or second pulse trains,

counter means responsive to said first and second control signals, and

display means responsive to said clock means and to said counter means for displaying a true numerical measure of the total angular motion of said angular position pick-off means,

wherein said phase detector means includes:

third bistable means having a data input responsive to the Q output of said first bistable means and a clocking input responsive to the Q output of said second bistable means, and

fourth bistable means having a data input responsive to the Q output of said second bistable means and a clocking input responsive to the Q output of said first bistable means.

4,334,223
MEDIAN DETECTOR

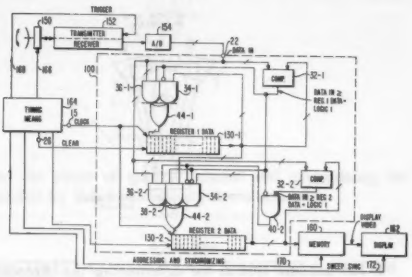
Kazuo Katagi, Woodland Hills, Calif., assignor to Sperry Corporation, New York, N.Y.

Filed Jun. 18, 1980, Ser. No. 160,462
Int. Cl.³ G01S *13/95*
U.S. Cl. 343—5 W **6 Claims**

6. In a weather radar system receptive serially of digital signals of values representing weather conditions at Z succeeding ranges from the system at a given azimuth position and then in order at successive azimuth positions at the same ranges, apparatus for determining the median of digital signals at each of said Z ranges for a given number X of azimuth positions comprising in combination:

a plurality Y of registers in an ordered array, where Y is not less than the whole number portion of $(X+1)\div 2$ each having Z storage locations, all positions in all registers being initially cleared to one of a maximum or minimum value, each register being responsive to a control signal for moving data contained therein from one storage location to another;

means responsive to the value of each of said serially presented digital signals and to the value of numbers in a preselected position of each of said registers for comparing the value of each of said serially presented numbers



with the values of said numbers in said preselected position in said registers and providing a signal indicative of the results of said comparisons;

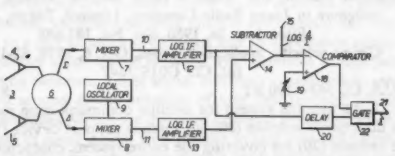
means responsive to said comparing means for placing said serially presented numbers in numerical order in a second different storage location in said registers; and

means producing said control signal for moving said numbers in said register storage locations from one location to another in correspondence with said values presented serially, whereby when Y.Z serially presented numbers have been received a preselected register will contain Z numbers representing the median values of Y azimuth positions at Z ranges.

4,334,224
SECONDARY SURVEILLANCE RADAR

John F. Gordon, Black Notley, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Jul. 30, 1980, Ser. No. 173,910
Claims priority, application United Kingdom, Aug. 23, 1979, 7929452
Int. Cl.³ G01S *13/78, 13/44*
U.S. Cl. 343—6.5 R **6 Claims**



1. A secondary surveillance radar including a directional antenna capable of being operated in sum and difference modes and which is arranged to receive replies from targets in response to transmitted interrogations; and circuit means connected to said antenna for deriving a sum signal and a difference signal from a received reply and for inhibiting the reply unless the amplitude of the sum signal exceeds that of the

difference signal by more than a predetermined amount other than zero.

4,334,225

ANTENNA SYSTEM FOR LOCATING A MICROWAVE SIGNAL SOURCE

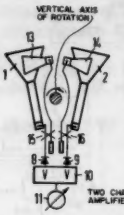
Reinhard Bredow, Gauting, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 1, 1980, Ser. No. 145,709

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1979, 2929254

Int. Cl.³ H04B *7/00*; H01Q *13/00*

U.S. Cl. 343—100 LE **8 Claims**



1. An antenna system for determining the direction of a signal source emitting microwave signals using two primary direction finding antennas designed for the same frequency with major radiation lobes which are identical and are angularly offset with respect to one another in the bearing plane with their major radiation lobes overlapping, so that the bearing direction of the signal source within the overlap range can be determined by means of signal level comparison or by means of ratio formation of the two signal voltages received by said primary antennas, characterized in that an auxiliary radiator (**13, 14**) is associated with each of the two primary antennas (**1, 2**) and the primary radiation directions of said two auxiliary radiators (**13, 14**) in the bearing plane are symmetrically offset by a respective specific angle relative to the primary radiation direction of the associated primary antenna (**1, 2**) and the primary radiation directions of said auxiliary radiators (**13, 14**) are in approximate opposite directions and each of the two primary antennas (**1, 2**) electrically connected to the associated auxiliary radiator (**13, 14**) such that received signal voltages are superimposed in amplitude and phase to obtain a radiation signal level which is amplified with respect to the primary radiation direction in the bearing plane for each primary antenna.

4,334,226

ANTENNA SYSTEM FOR SATELLITE COMMUNICATION

Kouichi Eguchi, and Tsuguya Inoie, both of Mitaka, Japan, assignors to Japan Radio Company, Limited, Tokyo, Japan

Filed Aug. 26, 1980, Ser. No. 181,665

Claims priority, application Japan, Oct. 6, 1978, 53-123762

Int. Cl.³ G01S *3/42*

U.S. Cl. 343—100 ST **9 Claims**

1. An antenna system for satellite communication including a directional antenna (**30**), an antenna support device (**10**) and a radome (**20**) for covering the entire system, characterized in that said antenna support device (**10**) comprises:

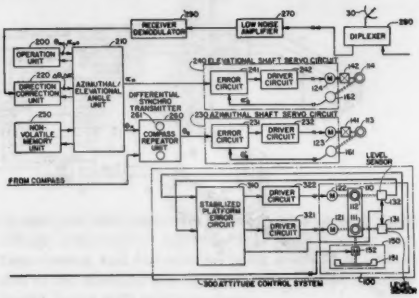
a horizontal stabilized platform (**110**) provided with two corrective shafts intersecting at right angles to each other;

flywheel means (**150**) having a spin vector that is always at right angles to a horizontal plane of said horizontal stabilized platform (**110**);

first tilt detector means (**131**) for converting a tilt of said horizontal stabilized platform (**110**) about the first corrective shaft (**111**) into an electric signal, and first control means (**122**) responsive to the output of said first tilt detector means (**131**) for controlling the second corrective shaft (**112**);

second tilt detector means (**132**) for converting a tilt of said horizontal stabilized platform (**110**) about the second corrective shaft (**112**) into an electric signal, and second control means (**121**) responsive to the output of said second tilt detector means (**132**) for controlling the first corrective shaft (**111**);

an azimuthal shaft (**113**) intersecting at right angles to the horizontal plane of said horizontal stabilized platform (**110**), third control means for controlling said azimuthal



shaft (**113**), the axes of said two corrective shafts (**111, 112**) and said azimuthal shaft (**113**) intersecting with each other substantially at one point; and

an elevational shaft (**114**) intersecting at right angles to said azimuthal shaft (**113**) for directing said directional antenna (**30**) in the elevational direction, and fourth control means for controlling said elevational shaft (**114**);

and that said horizontal stabilized platform (**110**) and a structure loaded thereon have such construction that torques induced by a gravity and a horizontal linear acceleration may be substantially counter-balanced within almost all the movable ranges about said corrective shafts (**111, 112**).

4,334,227

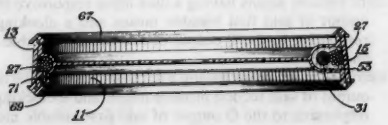
ELECTRONIC MARKER DEVICE AND METHOD OF MAKING SAME

Barry M. Marks, Austin, Tex., assignor to A.P.C. Industries, Inc., Austin, Tex.

Filed Sep. 26, 1980, Ser. No. 191,064

Int. Cl.³ H01Q *1/40, 1/04*

U.S. Cl. 343—719 **12 Claims**



1. An electronic marker device of the tuned circuit passive type comprising:

a. a mandrel portion of thermoplastic material having a hoop shape with the thickness of the hoop in the radial direction being substantially less than the width of the hoop in the axial direction and having outer peripheral surfaces and side edge surfaces;

b. a cover band of thermoplastic material having an inner peripheral surface that is matingly received by said mandrel portion outer peripheral surfaces, and having side edge surfaces, with said cover band being hermetically

sealingly engaged with said mandrel portion in the region of corresponding side edge surfaces;

c. a tuned circuit assembly disposed within said mandrel portion.

4,334,228

BIFILAR ANTENNA TRAP

Robert H. Johns, 3379 Papermill Rd., Huntingdon Valley, Pa. 19006

Continuation-in-part of Ser. No. 222,241, Jan. 2, 1981, which is a continuation-in-part of Ser. No. 162,928, Jul. 17, 1980. This application Mar. 31, 1981, Ser. No. 249,440

Int. Cl.³ H01Q *1/00*

U.S. Cl. 343—722 **2 Claims**

2. An antenna system having at least two wire radiating portions including a parallel resonant trap between them, said trap comprising

a bifilar winding of two capacitively coupled wire coils insulated from one another,

an electrical cross-connection between opposite ends of said bifilar coils formed by the continuation of the wire of one coil into the opposite end of the other coil,

electrical connections between said antenna radiating portions and said coils, formed by a continuation of the wire of said radiating portions into the ends of said coils that are not a part of said cross-connection, whereby the antenna system made up of traps and radiating portions is formed from a continuous length of wire,

a generally cylindrical hollow insulator having longitudinal slots in opposing cylinder walls passing inwardly from each end of said insulator for a portion of the length of the insulator, and having transverse oblique slots generally parallel to one another intersecting the inner ends of one of the longitudinal slots at each end of the insulator, whereby said bifilar coils are secured to said insulator and said antenna wire radiating portions are attached to said insulator.

4,334,229

LEAKY WAVEGUIDE CONTINUOUS SLOT ANTENNA

Arthur P. Boblett, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 12, 1968, Ser. No. 775,997

Int. Cl.³ H01Q *13/00*

U.S. Cl. 343—767 **4 Claims**

1. A continuous-slot leaky-waveguide antenna in which arbitrary current functions can be imposed which leads to improved and predictable far E-field elevation patterns, comprising:

(a) a section of rectangular waveguide,

(b) a long straight continuous slot cut in one broad face of said waveguide along the centerline passing through each end of said waveguide section,

(c) at any point along the length of said straight slot one of the narrow sides of said waveguide section being offset to form a curve away from said centerline while the other narrow side of the waveguide being offset to curve toward said centerline,

(d) the offset of each side and the total distance between said sides along the length of said slot being varied for adjusting the phase of energy radiated and determining the desired far E-field elevation pattern desired.

4,334,230

DIRECTIVITY-CONTROLLABLE ANTENNA SYSTEM

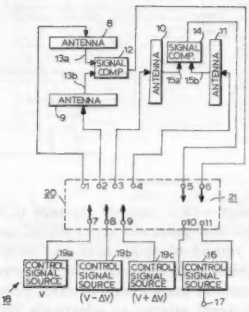
Johji Kane, Sakai, Japan, assignor to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Jul. 3, 1980, Ser. No. 165,940

Claims priority, application Japan, Jul. 9, 1979, 54-86785; Jul. 9, 1979, 54-86788

Int. Cl.³ H01Q *3/26, 21/26*

U.S. Cl. 343—797 **5 Claims**



1. A directivity control antenna system comprising: an antenna unit having first through fourth dipole antennas in which two-terminal variable reactance circuits are respectively connected to a pair of antenna elements and an impedance adjusting capacitor is connected between feed terminals of said pair of antenna elements; a first signal combiner connected to said first and second dipole antennas of said first through fourth dipole antennas, which are disposed opposite to each other, by feed lines of equal length with respect to said first and second dipole antennas for combining signals from said first and second dipole antennas; a second signal combiner connected to said third and fourth dipole antenna of said first through fourth dipole antennas, which are disposed opposite to each other are perpendicular to said first and second dipole antennas, by feed lines of equal length with respect to said third and fourth dipole antennas for combining signals from said third and fourth dipole antennas; tuning control means for supplying a plurality of DC voltages which are different from each other;

changeover control means coupled to said tuning control means for selectively supplying said plurality of DC voltages from a first through a fourth output terminal thereof to said first through fourth dipole antennas for control of the reactances of said two terminal variable reactance circuits of said first through fourth dipole antennas so as to control the directivity of said antenna system, said changeover control means being also coupled to said first and second signal combiners for selectively passing output signals from said first and second signal combiners to a fifth and a sixth output terminal thereof; and a third signal combiner coupled at two input terminals thereof to said fifth and sixth output terminals of said changeover control means for outputting, to a receiver, output signals of said first or second signal combiner or combined output signals of said first and second signal combiners, wherein connection of said first and second signal combiners to said third signal combiner via said changeover control means made is by feed lines of equal length with respect to said first and second signal combiners.

4,334,231

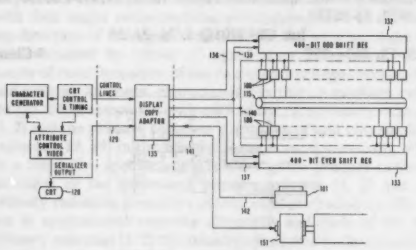
NON IMPACT DISPLAY SCREEN OUTPUT PRINTER

John L. Regehr, Stewartville, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 973,212, Dec. 26, 1978, abandoned. This application Apr. 28, 1980, Ser. No. 144,499

Int. Cl.³ G01D *9/00, 15/10*

U.S. Cl. 346—35 **7 Claims**



1. In combination with a cathode ray tube (CRT) display device of the type that generates serial digital raster display data, horizontal retract blanking data and vertical retrace blanking data which are combined into a composite video signal by CRT circuitry using a train of clock pulses with said composite video signal utilized to selectively illuminate the CRT screen by continuously refreshing horizontal rows of dot positions; thermal printer and interface means for reproducing the information shown on such CRT display screen on a thermographic medium comprising:

thermal print means including a row of thermal print elements having a print element for each dot position of a raster scan row on said CRT screen;

buffer means for retaining a line of serial digital raster display data;

print control means including gating means for selectively actuating said thermal print elements in accordance with information retained in said buffer means; and

connecting means for interfacing serial digital raster display data line by line simultaneously to said buffer means and said CRT circuitry, whereby the same raster bit data is used by both display and printer without the need to separate data bits from other information and resynchronize data for print purposes.

4,334,232

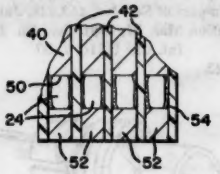
LAMINATED CHARGE PLATE FOR AN INK JET PRINTING DEVICE AND METHOD OF MANUFACTURING SAME

Donald L. Head, Kettering, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 1,710, Jan. 8, 1979, abandoned. This application Jul. 14, 1980, Ser. No. 168,472

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—75 **11 Claims**



1. A charge plate for an ink jet printing device having a plurality of spaced orifices defined therein in a common plane for printing liquid discharge, comprising:

a plurality of conductive and nonconductive elements secured together in alternating sequence in a direction perpendicular to said common plane of the orifices to form an elongated charge plate of generally rectangular cross section with said conductive elements separated by said nonconductive elements a sufficient distance that said conductive elements will be in registry one each with a corresponding one of said orifices in said ink jet printing device, an edge portion of each said conductive element forming a charging surface parallel to and adjacent the flow of printing liquid from said orifices;

all of said charging surfaces being recessed between adjacent edge portions of said nonconductive elements and exposing side wall surfaces of said edge portions of said nonconductive elements; and

a coating of conductive material on said side wall surfaces and engaging said charging surface.

4,334,233

OPTICAL RECORDING ELEMENT AND ITS MANUFACTURING METHOD

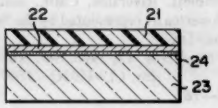
Teruo Murakami, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 1, 1980, Ser. No. 165,049

Claims priority, application Japan, Jul. 16, 1979, 54-89272

Int. Cl.³ G01D *15/34, 15/10*

U.S. Cl. 346—135.1 **7 Claims**



1. An optical recording element comprising:

a light-transmitting protective layer having thickness between 200 μm and 2.0 mm;

intermediate layers including a recording layer and at least one of an aluminum layer and a silicon dioxide layer, said intermediate layers being deposited continuously onto said protective layer;

a substrate fixed to said intermediate layers; and

an adhesive layer located between said intermediate layer and said substrate to securely adhere said intermediate layer and said substrate, whereby a recording beam or a

reproduction beam is irradiated onto said recording layer through said protective layer.

4,334,234

LIQUID DROPLET FORMING APPARATUS

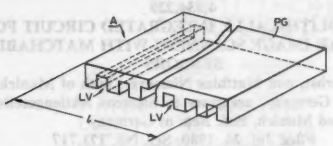
Yoshiaki Shirato, Yokohama; Yasushi Takatori, Sagamihara; Toshitami Hara, Tokyo; Yukuo Nishimura, Sagamihara, and Michiko Takahashi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1980, Ser. No. 134,769

Claims priority, application Japan, Apr. 12, 1979, 54-39479; Apr. 12, 1979, 54-39483; Apr. 12, 1979, 54-39533

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **21 Claims**



1. A liquid droplet forming apparatus which comprises a predetermined number of actuating chambers each of which has an opening for ejecting a liquid droplet, and an intermediate liquid chamber for supplying the liquid to the actuating chamber, the intermediate liquid chamber being communicated with the actuating chambers, communicating ports between the intermediate liquid chamber and the actuating chambers being present at a region of the inside wall surface of the intermediate liquid chamber, and a ratio of W/S being 50-300 where W is the area of the region of the inside wall surface of the intermediate liquid chamber where the communicating ports exist and S is the total opening area of the communicating ports.

4,334,235

INSULATED GATE TYPE SEMICONDUCTOR DEVICE

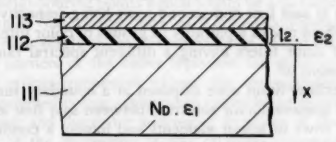
Jun-ichi Nishizawa, Sendai, Japan, assignor to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

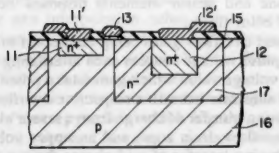
Filed Mar. 14, 1979, Ser. No. 20,498

Claims priority, application Japan, Mar. 23, 1978, 53-33942

Int. Cl.³ H01L *29/78*

U.S. Cl. 357—23 **16 Claims**





1. An insulated gate type transistor formed in a semiconductor chip, comprising:

a heavily-doped source semiconductor region of a first conductivity type, for supplying charge carriers;

a heavily-doped drain semiconductor region of said first conductivity type, for receiving the carriers supplied from said source;

a channel semiconductor region formed between said source and drain regions, having a second conductivity type opposite to said first conductivity type;

an insulated gate structure including an insulating film formed on said channel semiconductor region and a conductive gate electrode formed on said insulating film;

said channel region having such dimensions and a resistivity that the potential profile from said source region to said drain region for the carriers supplied from said source has a potential barrier which can be controlled by potentials of said gate structure and of said drain region, and

means provided in the neighborhood of said source region for increasing the ratio of the amount of carriers reaching said drain region to the total amount of carriers supplied from said source region.

4,334,236

ONE-TRANSISTOR DYNAMIC RAM WITH POLY BIT LINES

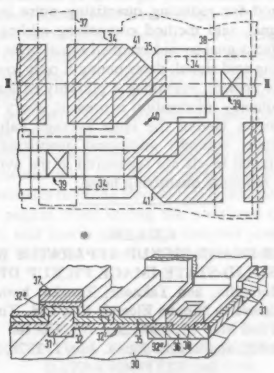
Kurt Hoffmann, Taufkirchen, and Heinrich Schulte, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 20, 1979, Ser. No. 67,926

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1978, 2837877

Int. Cl.³ H01L *27/10, 29/04;* G11C *11/40*

U.S. Cl. 357—59 **3 Claims**



1. An MOS integrated semiconductor memory, comprising: a semiconductor substrate; a plurality of memory locations arranged in lines and columns; each memory location having two one-transistor memory cells on the substate; each memory cell comprising an MOS memory capacitor and an MOS transistor; a word line running in the line direction arranged to control gates of the two one-transistor memory cells of a memory location; the two MOS transistors at each memory location each being coupled to a respective bit line which runs at one side of the memory location in the column direction and between two adjacent columns; for each one-transistor memory cell at the memory location an electrode of the MOS memory capacitor being formed by a first polysilicon layer and a gate of the MOS transistor being formed by a second polysilicon layer; the bit line associated with each one-transistor memory cell being formed by a third polysilicon layer as a polysilicon path; each bit line being coupled to the MOS transistor of each one-transistor memory cell by a respective limited doped connection zone in the semiconductor substrate; and at each mem-

ory cell one of the polysilicon layer bit lines being positioned in insulated fashion over the first polysilicon layer which forms the electrode of the memory capacitor of the respective one-transistor memory cell, the first polysilicon layer passing completely under the bit line separating the two adjacent columns of memory cells and directly connecting electrodes of the MOS memory capacitors in at least one memory cell in each of the two adjacent columns.

4,334,237

ADAPTIVE AMPLITUDE AVERAGING FOR WEIGHTING QUANTIZING NOISE

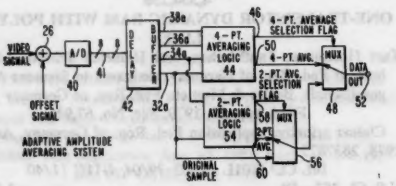
Glenn A. Reitmeier, Trenton, and Robert A. Dischert, Burlington, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 15, 1980, Ser. No. 149,998

Claims priority, application United Kingdom, Feb. 7, 1980, 8004196

Int. Cl.³ H04N *5/21*

U.S. Cl. 358—36 **24 Claims**



1. A method for reducing quantizing noise in a sampled quantized signal, said method comprising adding a periodic multilevel offset signal to said sampled signal prior to quantization, quantizing said signal, determining if only low frequency information is present, averaging a plurality of samples when only low frequency information is present, every plurality of averaged samples having the same average value of offset signal amplitude, whereby additional quantizing levels between the original levels are recovered in the averaged samples, thereby reducing quantizing noise.

4,334,238

COLOR IMAGE PICKUP APPARATUS WITH MULTI-SOLID-STATE IMAGE PICKUP DEVICES

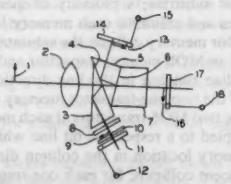
Masanobu Morishita, and Takanori Tanaka, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed May 27, 1980, Ser. No. 153,163

Claims priority, application Japan, Jun. 1, 1979, 54-69093

Int. Cl.³ H04N *9/07*

U.S. Cl. 358—43 **14 Claims**



1. A solid state color image pickup apparatus comprising:

image separating optical means for separating an incident light of an object into a plurality of light beams diverging in a plurality of directions to form images of said object in the corresponding optical paths of said light beams;

a plurality of solid state image pickup means, each of said pickup means having a plurality of picture elements displaced from each other by a predetermined distance;

first and second of said solid state image pickup means being disposed to separately receive at least two individually associated ones of said images formed by said diverging light beams, said two images having a first spectro-characteristic requiring a high visible resolution, the relative positions of the picture elements and the received image being displaced between said first and second solid state image pickup means by a distance corresponding to a half of said predetermined distance; and

a third of said solid state image pickup means being disposed to receive another image formed by said diverging light beams and having a second spectro-characteristic.

4,334,239

MONOLITHICALLY INTEGRATED CIRCUIT FOR LINEAR IMAGE SCANNING WITH MATCHABLE SENSORS

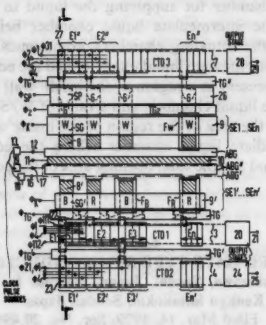
Heiner Herbst, and Matthias Niemeyer, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 24, 1980, Ser. No. 171,717

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1979, 2939403

Int. Cl.³ H04N *9/07*

U.S. Cl. 358—44 **6 Claims**



1. In a circuit for linear image scanning monolithically integrated on a semiconductor substrate havig first and second parallel rows of opto-electronic sensor elements with sensor elements in said first and second rows being respectively disposed behind one of a plurality of groups of color filters, each group of color filters having a different spectral range, the improvement of:

an overflow drain zone disposed at a boundary surface of said semiconductor substrate between said first and second rows of sensor elements and having a conductivity opposite to said semiconductor substrate and connected to a constant operating potential;

a plurality of overflow gates disposed between said overflow drain zone and sensor elements disposed behind each group of color filters,

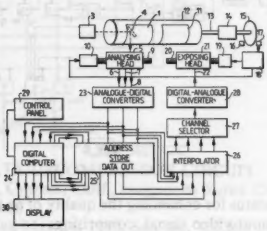
each of said overflow gates being connected to respective clock pulse voltage sources each alternating between a lower voltage value which generates a potential barrier in said substrate beneath a respective overflow gate for preventing transfer of charge from a sensor element into said overflow drain zone, and an upper voltage value for allowing transfer of said charge from a sensor element into said overflow drain zone,

whereby the respective duty times of the pulses from said clock pulse voltage sources are selected for compensating and balancing variations in sensitivity to said different spectral ranges of said sensor elements.

4,334,240
INTERPOLATION METHODS AND APPARATUS

Paul E. Franklin, London, England, assignor to Crosfield Electronics Limited, London, England

Filed Jul. 2, 1980, Ser. No. 165,435
Claims priority, application United Kingdom, Jul. 3, 1979, 7923175
Int. Cl.³ G03F 3/08
U.S. Cl. 358—78 6 Claims

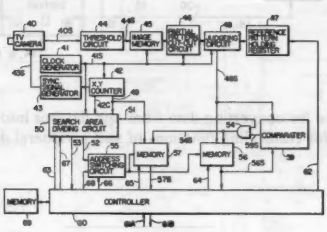


1. A method of reproducing a coloured original in which the original is scanned to obtain signals representing three colour-component densities of successively scanned picture elements of the original and in which said signals are corrected before being used to control the treatment of an output surface, said method comprising, prior to the scanning of the original, the steps of deriving, for each of a number of sets of three input digital colour-component values fewer in number than the sets of possible input digital colour-component values available from the scanner, a set of four corrected colour component values in digital form, one for each of the three colour components and one for black, and loading the sets of four corrected colour-component digital values into storage locations of a three-dimensional store, said store being represented as a cubic matrix consisting of adjacent unit interpolation cubes, each unit interpolation cube being formed by an addressed point and the seven neighbouring points which would be addressed by incrementing by one "coarse" unit, each colour-component density signal value singly and in all combinations, so that the locations of the corners of the cubes represent the three-dimensional digital colour-component values. the corresponding sets of four corrected colour-component values being stored at those locations; and thereafter addressing locations of the store by means of the succession of sets of three colour-component signals derived from the scanning of the original to obtain from the store a corresponding succession of corrected digital values, obtaining values intermediate the sets of digital values stored for unit interpolation cubes of said matrix by on-line interpolation, controlling the treatment of the output surface in accordance with the four values obtained from the interpolation, in which each of the four values for a point within a unit interpolation cube of the matrix is obtained by first determining in which of three pyramids, which together make up the unit interpolation cube and have as a common edge the "neutral axis" of the unit interpolation cube, said point is contained, and deriving a value for said point by interpolation within the pyramid, whereby each of the values for said point is the sum of predetermined functions of the values for the vertices of the pyramid, said functions also varying with the distances of said point from faces of the pyramid.

4,334,241
PATTERN POSITION DETECTING SYSTEM

Seiji Kashioka, Hachiouji; Yoshihiro Shima, Kokubunji, and Takafumi Miyatake, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 14, 1980, Ser. No. 140,415
Claims priority, application Japan, Apr. 16, 1979, 54-45353
Int. Cl.³ H04N 7/18
U.S. Cl. 358—107 7 Claims



1. A pattern position detecting system comprising imaging means to pick up an image of an object which includes a target pattern to-be-detected, first means connected with said imaging means and to successively cut out local patterns of an image surface on the basis of image signals delivered from said imaging means, second means to successively generate positional coordinates which indicate typical positions of the respective local patterns cut out, third means to compare the respective local patterns with a standard pattern having the same feature as that of the target pattern and to obtain degrees of coincidence, fourth means connected with said second and third means and to compare the degree of coincidence with the degrees of coincidence of the other local patterns in the vicinity of the particular local pattern so as to successively sample the local patterns whose degrees of coincidence become the maximum, said fourth means storing the positional coordinates and degrees of coincidence of the respective local patterns whose degrees of coincidence become the maximum, and fifth means connected with said fourth means and to sample positional coordinates fulfilling a positional relationship inherent to the target pattern from among the positional coordinates finally left in said fourth means, the sampled positional coordinates being identified as indicating a position of said target pattern.

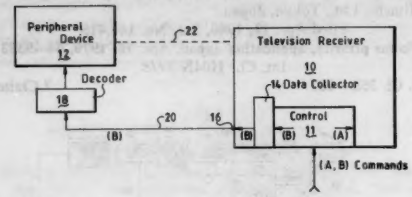
4,334,242
REMOTE CONTROL TELEVISION WITH EXTERNAL DATA BUS CONNECTION

Hans Mangold, Fuerth, Fed. Rep. of Germany, assignor to Grundig E.M.V., Fed. Rep. of Germany

Continuation of Ser. No. 887,300, Mar. 16, 1978, abandoned.
This application Jan. 14, 1980, Ser. No. 112,098
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 2714501
Int. Cl.³ H04N 5/76, 5/64
U.S. Cl. 358—127 4 Claims

1. A system for the use of a television receiver for external control of electronic peripheral devices, said television being of the type including a built-in integrated circuit remote control receiver, said remote control receiver being divided into two sections, one section being allocated to the remote control of the receiving and reproduction sections of the television receiver and the other section being allocated to a databus having nothing to do with the television receiver receiving and reproduction sections; an output terminal of said databus comprising an adaptor connector between said television receiver and an external peripheral device; a peripheral device external to the television receiver; cable means connecting the output of

said databus with said peripheral device; and a decoder interposed between said databus output terminal and peripheral



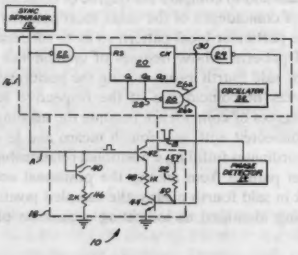
device for converting data from said databus into a form suitable for controlling functions of said peripheral device.

4,334,243

PULSE WIDTH LIMITER

Gopal K. Srivastava, Buffalo Grove, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jan. 12, 1981, Ser. No. 224,593
Int. Cl.³ H04N 5/08, 5/04
U.S. Cl. 358—153 **5 Claims**



1. In a television receiver having a sync separator for generating a composite sync signal including horizontal sync pulses and vertical sync pulses, and having a horizontal phase detector adapted to receive horizontal sync pulses for synchronizing the latter pulses with flyback pulses generated by the receiver, a pulse width limiter for extracting the horizontal sync pulses from the composite sync signal developed by the sync separator and for applying the extracted horizontal sync pulses to the horizontal phase detector, comprising:

a signal processing path having an input terminal receiving the composite sync signal, having an output terminal coupled to the phase detector, and having switch means for coupling the input terminal to the output terminal and for decoupling the input terminal from the output terminal in response to a disabling signal; and

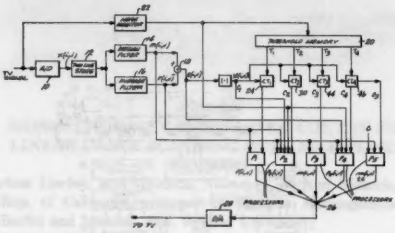
a pulse width sensor receiving the composite sync signal for detecting the width of each pulse therein and for applying a disabling signal to said switch means in response to each pulse in the composite sync signal which has a width greater than a predetermined horizontal sync pulse width so as to prevent portions of the pulses greater than the predetermined width from being coupled to the phase detector.

4,334,244

ADAPTIVE IMAGE ENHANCEMENT SYSTEM

James K. Chan, Cerritos; Curtis L. May, San Pedro, and Allan Spooner, Cypress, all of Calif., assignors to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Filed Jul. 28, 1980, Ser. No. 173,005
Int. Cl.³ H04N 5/14
U.S. Cl. 358—166 **9 Claims**



4. Apparatus for enhancing the quality of an image produced from an input video signal, comprising:

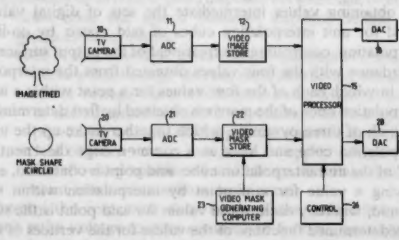
analog-to-digital converter receiving the video signal and converting the signal to a succession of digital samples of the video signal, means storing a plurality of said digital samples, means selecting a first predetermined group of stored digital samples for generating a median sample corresponding in magnitude to the median value of said first group of stored digital samples in response to each new digital sample of the video signal, means selecting a second predetermined group of stored digital samples for generating an average sample corresponding in magnitude to the average value of said second group of stored samples in response to each new digital sample of the video signal, digital processing means for selecting one of a plurality of possible output samples in response to each average sample and each median sample, each of the possible output samples being dependent on the changes in the magnitude of the difference between the median sample and the average sample, and a digital-to-analog converter for converting the output samples of said digital processing means back to an output video signal.

4,334,245

T.V. SPECIAL EFFECTS GENERATOR

Peter C. Michael, Newbury, England, assignor to Micro Consultants Limited, Berkshire, England

Continuation-in-part of Ser. No. 886,017, Mar. 13, 1978, abandoned. This application Aug. 26, 1980, Ser. No. 181,500
Claims priority, application United Kingdom, Mar. 17, 1977, 11361/77
Int. Cl.³ H04N 5/22
U.S. Cl. 358—183 **29 Claims**



1. A television special effects generator comprising:

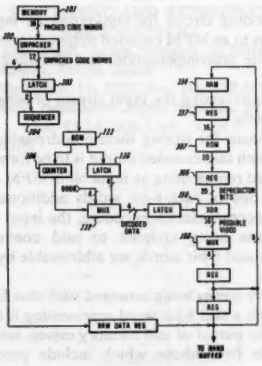
video image storage means for storing a video image;
mask data means for providing mask shape information representative of a masking shape; and
coefficient processing means for receiving and processing the stored video image to provide an image of modified shape comprised of a plurality of picture points each synthesised from adjacent picture point information in dependence on masking shape information provided by said mask data means.

4,334,246

DATA DECOMPRESSOR CIRCUIT

Amitabh Saran, Cypress, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 16, 1980, Ser. No. 150,505
Int. Cl.[3] H04N 7/12
U.S. Cl. 358—261 13 Claims



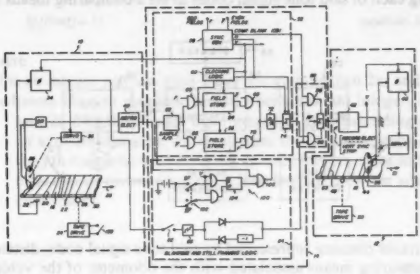
1. A data decompressor for decoding and depredicting a series of scan lines of compressed video data into actual video, said data comprising variable length code words packed into fixed length compressed video data words, said code words comprising a run length portion or a terminating portion, said decompressor comprising:
an unpacker for putting together into an unlimited string a series of fixed length data words, and for separating said string into variable length code words,
a decoder for translating each of said run length portions of said code words into an output comprising a series of zeros and for translating each of said terminating portions into an output comprising a decoded video pattern for ones and zeros,
a depredictor for inspecting selected bits of the actual video in the previous scan line and in the previous bits of the current scan line, and therefrom, producing an output comprising the next set of predicted video bits, and
a comparator for comparing the output of said depredictor and the output of said decoder, producing therefrom actual video and for providing said depredictor with said actual video for use in the depredictor of the following sets of predicted video bits.

4,334,247

APPARATUS USEFUL FOR CONVERTING ASYNCHRONOUS VIDEO INFORMATION TO SYNCHRONOUS VIDEO INFORMATION

James U. Lemke, Del Mar, Calif., assignor to Spin Physics, Inc., San Diego, Calif.

Filed Jun. 26, 1980, Ser. No. 163,247
Int. Cl.[3] H04N 5/79
U.S. Cl. 360—10 15 Claims



1. Apparatus useful with
(a) a first device for playing video information signals magnetically recorded along the length of a magnetic tape, and which video information signals may be periodically asynchronous with respect to a timing reference, and
(b) a second device for recording, under control of a vertical sync signal, video information signals along the length of a magnetic tape,
said apparatus comprising
(a) means for producing horizontal and vertical sync signals having respective nominal frequencies,
(b) means for receiving and temporarily storing video information signals under control of said vertical sync signal, said means for receiving and storing being adapted to receive video information signals played back by said first device,
(c) means adapted to receive said vertical and horizontal sync signals and the video information signal output of said means for receiving and temporarily storing video information signals for combining said video information signal output with said vertical and horizontal sync signals into a composite video signal,
said means for combining being coupled to said second device to apply said composite video signal to said second device, and said apparatus including means for applying said vertical sync signal to said first device for controlling its operation,
whereby despite periods of asynchronism in the video information signals played back by said first device, said second device records video information signals without periods of asynchronism therein.

4,334,248

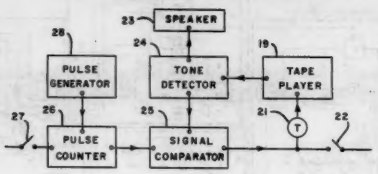
VERBAL TRAVEL INSTRUCTION SYSTEMS AND METHOD

Nicholas P. Malocco, 58 Plankton St., Bridgeport, Conn. 06606

Filed Feb. 19, 1980, Ser. No. 122,630
Int. Cl.[3] G11B 5/00
U.S. Cl. 360—12 5 Claims

1. A system for recording and playing back a series of travel instruction messages on a magnetic tape in a tape-recording and play-back device for use in a vehicle having an odometer, each said instruction message comprising a tone signal code representing a distance to be travelled by the vehicle to reach a location, and a verbal direction message pertinent to the operation of the vehicle when it reaches said location, said system comprising a tape-recording and play-back device;

digital means associated with said tape-recording and play-back device for recording on said magnetic tape a series of said tone signal codes, each of which is to be played back in advance of a verbal direction message pertinent thereto to form a travel instruction message; means associated with said tape-recording and play-back device for recording on said magnetic tape a series of verbal direction messages, each of said direction messages to be recorded subsequent to a pertinent tone signal code; tone detecting and decoding means associated with said tape-recording and play-back device for detecting and decoding each of said tone signal codes to set a comparing means for



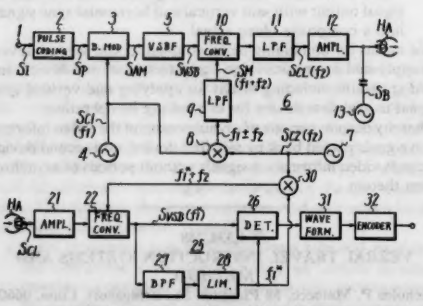
a travel distance represented by said tone signal code; distance measuring means associated with the odometer of the vehicle and with said comparing means for registering in said comparing means the distance travelled by the vehicle; said comparing means causing activation of said play-back device when the distance travelled by the vehicle corresponds to the travel distance represented by the first tone signal code, whereby the first verbal direction message pertinent to said tone signal code is played back to guide the operator of the vehicle at the pertinent location, and a second tone signal code is played back to reset the comparing means for a second travel distance represented by said second tone signal code.

4,334,249

APPARATUS FOR USE IN RECORDING A PULSE SIGNAL ON A MAGNETIC RECORDING MEDIUM

Eiichi Yokoyama, Machida, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 26, 1979, Ser. No. 107,355
Claims priority, application Japan, Dec. 28, 1978, 53-165180
Int. Cl.³ G11B *5/04, 15/02*
U.S. Cl. 360—30 **15 Claims**



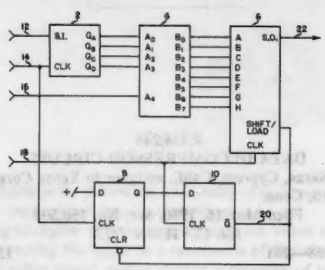
1. In apparatus for recording pulse signals on a magnetic recording medium, said pulse signals having gradually rising and falling edges between at least first and second information levels, said rising and falling edges exhibiting a gradient, which edges traverse a predetermined level, modulating means for modulating the amplitude of a carrier signal with said pulse signals to produce a modulated signal for recording and comprising amplitude modulating means supplied with said carrier signal and with said pulse signals, said amplitude modulating means having a modulation factor such that the modulated carrier signal is substantially suppressed at said predetermined level when traversed by said rising and falling edges but not at said at least first and second information levels.

4,334,250

MFM DATA ENCODER WITH WRITE PRECOMPENSATION

John G. Theus, Tigard, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 887,403, Mar. 16, 1978. This application Sep. 12, 1979, Ser. No. 74,600
Int. Cl.³ G11B *5/09*
U.S. Cl. 360—45 **7 Claims**



1. An encoding circuit for converting an input stream of serial data bits to an MFM encoded output stream of serial data bits with write precompensation; said encoding circuit comprising:

means for converting the input stream of serial data bits to parallel bits;

memory means for storing therein addressable 8-bit words from which said encoded output is to be formed, each said 8-bit word representing an input bit in MFM encoding and at least one of said 8-bit words additionally including write precompensation encoding, the input of said memory means being coupled to said converting means whereby said 8-bit words are addressable by said parallel data bits;

said memory means being arranged such that for each parallel data bit a said 8-bit word representing it is made available at the output of said memory means, said word being selectable from those which include precompensation encoding when the context of said parallel data bit so required;

means coupled to the output of said memory means for converting said addressable 8-bit words from parallel to serial form providing the output stream of serial data bits; and

means for controlling the transfer of said addressable 8-bit words from said memory means to said parallel-to-serial converter means.

4,334,251

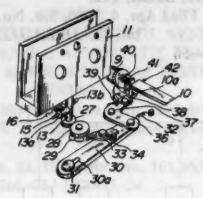
TAPE RECORDER HAVING CASSETTE REVERSING DEVICE

Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Continuation of Ser. No. 952,840, Oct. 19, 1978, abandoned. This application Jun. 6, 1980, Ser. No. 157,106
Claims priority, application Japan, Oct. 20, 1977, 52-126232; Oct. 20, 1977, 52-126233; Nov. 14, 1977, 52-136466; Nov. 14, 1977, 52-136467
Int. Cl.³ G11B *5/40*
U.S. Cl. 360—96.6 **20 Claims**

1. A cassette tape recorder comprising a housing body, a cassette chamber in the body, a cassette holder for holding a

tape cassette therein and movably mounted on the housing body for movement into and out of the chamber, at least one magnetic head for contacting tape in the cassette when the holder holds a cassette in the chamber, means for driving a magnetic tape in the tape cassette when the holder holds a cassette in the chamber, and a urging means for reversing the tape cassette when held in the cassette holder; said reversing



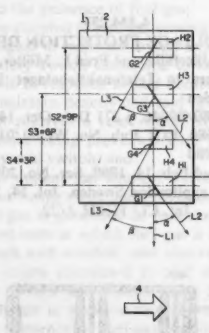
device including actuating means for actuating a holder movement and coupling means coupling the actuating means to the holder for moving the holder out of the chamber in response to a first operation of the actuating means and for rotating the thus moved holder 180° in response to a second operation of said actuating means, whereupon the cassette holder may be reinserted into the chamber and the actuating means again be actuated.

4,334,252

MAGNETIC RECORDING AND REPRODUCING HEAD ARRANGEMENT

Jirou Toriu, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1980, Ser. No. 129,409
Claims priority, application Japan, Mar. 20, 1979, 54-32569
Int. Cl.³ G11B *5/48, 21/02*
U.S. Cl. 360—104 **6 Claims**



1. A magnetic recording and reproducing head arrangement for use with a moving magnetic recording medium, comprising:

an even number 2n of magnetic heads (n being an integer not less than 1) each including a magnetic gap and spaced apart from each other at least by a distance effective for preventing magnetic interferences between said magnetic heads, said magnetic heads being so disposed with respect to the recording medium that said magnetic heads, in use, are effective for forming and tracking recorded tracks on the recording medium, said tracks having a track pitch P therebetween; and

means for both supporting said magnetic heads in a fixed positional relationship therebetween and for shifting in steps said magnetic heads, when the tracks to be recorded or reproduced are to be changed, in a direction perpendicular to the direction of movement of portions of the recording medium adjacent to said magnetic heads, each of said steps being equal to 2n times said pitch P of the tracks to be formed on the recording medium;

wherein centers of said gaps of at least two magnetic heads of said 2n magnetic heads lie in a straight line parallel to said direction of shift of said magnetic heads;

wherein said magnetic gap center of the j th magnetic head is spaced apart in the direction of shift of said magnetic heads by a distance Sj from that of an outermost magnetic head, said distance Sj satisfying the equation:

$$Sj/P=(j-1) \quad \text{modulo } 2n,$$

where

j is an integer not less than 1 but not greater than 2n; and

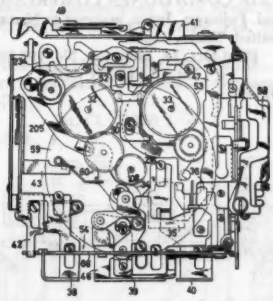
wherein the j th magnetic heads, j being an odd integer, of said 2n magnetic heads have magnetic gaps extending in an azimuth direction different from the magnetic gaps of the j th magnetic heads, j being an even integer, so as to be effective to prevent magnetic interference between adjacent tracks.

4,334,253

TAPE RECORDER

Kazuyasu Motoyama, and Toshikazu Kato, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1980, Ser. No. 123,686
Claims priority, application Japan, Mar. 2, 1979, 54-24149
Int. Cl.³ G11B *15/24*
U.S. Cl. 360—137 **17 Claims**



1. A tape recorder comprising:

playback, recording, and stop button plates urged to their respective original positions by the biasing forces of respective first, second and third biasing means and slidably mounted in parallel on a base plate; and

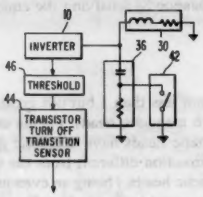
a lock mechanism including a seesaw lever disposed in a plane across the sliding direction of said playback button plate and having at one end portion thereof a lock strip capable of engaging said playback button plate,

said seesaw lever being rockably mounted to cause said lock strip to engage said playback button plate when said playback button plate is pressed and retreated from the original position thereof to a playback position against the biasing force of said first biasing means, whereby said playback button plate is prevented from returning from the playback position to the original position.

4,334,254
GATED SNUBBER CIRCUIT

Richard H. Baker, Bedford, Mass., and Arthur A. Baumgarten, Jr., Morris Plains, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jan. 25, 1980, Ser. No. 115,208
Int. Cl.[3] H02H 7/122
U.S. Cl. 361—9 37 Claims



1. In an inverter system of a type comprising transistor means selectively switched on and off to deliver bidirectional current flow between a D.C. power source and an inductive load, wherein a transient high voltage tends to be generated by the inductive load across the inverter system during each turnoff transition of said transistor means:

an active snubber circuit for suppressing said load generated transient voltage, comprising snubber means connected in shunt with said inductive load;

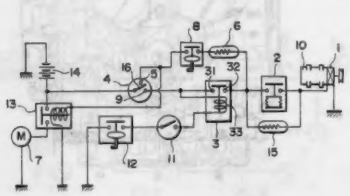
means for monitoring current flow through said transistor means; and

gating means controlled by said monitoring means for gating on said snubber means only during turn off periods of said transistor means.

4,334,255
PROTECTION DEVICE FOR A VEHICLE-MOUNTED AIR CONDITIONER COMPRESSOR

Masao Izumi, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Tokyo, Japan

Filed Oct. 14, 1980, Ser. No. 196,299
Int. Cl.[3] H02H 7/00
U.S. Cl. 361—22 3 Claims



1. A protection device for a vehicle air conditioner compressor comprising:

an electro-magnetic clutch of an air conditioner compressor;

an ignition switch having a plurality of contacts including an on contact and a starter contact;

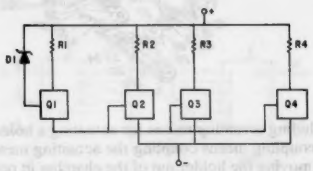
a compressor relay having a pair of relay contacts, each of which being connected respectively to the on contact of the ignition switch and a terminal of the electro-magnetic clutch, the relay coil of which is energized by an electric current flowing through the on contact of the ignition switch; and

a PTC ceramic resistor connected between the starter contact of the ignition switch and the terminal of the electro-magnetic clutch, said PTC ceramic resistor being provided for allowing a driving current of said electro-magnetic clutch for a predetermined duration after a time when said ignition switch is switched to said starter contact.

4,334,256
AUTOMOTIVE SURGE SUPPRESSOR

Joe D. Mings, McKinney, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 4, 1980, Ser. No. 137,200
Int. Cl.[3] H02H 3/22
U.S. Cl. 361—56 6 Claims



1. A circuit for protecting an electrical device or system from a transient power surge in its power source while maintaining full operating power to said device or system, comprising:

means for detecting said surge;

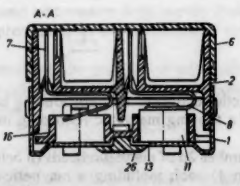
means for generating a control signal indicative of the presence of said surge;

means responsive to said control signal for directing said surge through said circuit, having a plurality of series-coupled transistor-resistor current-carrying paths in parallel, each said path self regulated in current flow, all of said plurality of paths opened to current flow equally and simultaneously by a common signal.

4,334,257
OVERVOLTAGE PROTECTION DEVICE

Per A. A. Ekdahl, Järfälla, and Fred L. Möller, Varby, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

PCT No. PCT/SE80/00046, § 371 Date Oct. 14, 1980, § 102(e) Date Sep. 26, 1980, PCT Pub. No. WO80/01741, PCT Pub. Date Aug. 21, 1980
PCT Filed Feb. 14, 1980, Ser. No. 209,464
Claims priority, application Sweden, Jul. 14, 1979, 7901321
Int. Cl.[3] H02H 3/22
U.S. Cl. 361—119 4 Claims



1. An overvoltage protection device for wires, preferably telephone wires,

comprising overvoltage arresters (11) of the discharge tube type and connection clamps (7, 8) for the wires, said connection clamps being mounted in a terminal block (2) and pressed against one of the poles of the overvoltage arresters (11),

the opposite pole of the overvoltage arresters being supported against a holder (1) formed of sheet metal and providing a ground connection, characterized in that

the overvoltage arresters (11) are enclosed in a detachable

cassette (16) of insulating material placed in a space between the terminal block (2) and the holder (1),

and in that terminal block (2) is pivotal about pins (4) at one of its ends,

thereby allowing access to the space between the terminal block (2) and the holder (1) for insertion and removal of the cassette (16).

4,334,258

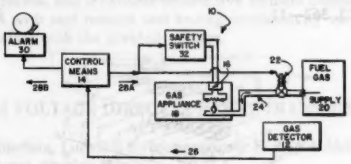
EXPLOSION PREVENTION CONTROL SYSTEM FOR A FUEL-GAS BURNING AUTOMATIC IGNITION APPLIANCE AND ASSOCIATED GAS DISTRIBUTION SYSTEM

Jeffrey L. Seeman, 263 Lakeview Ave., Brightwaters, N.Y. 11718, and James A. Dionian, 133 Moody Ave., Islip, N.Y. 11751

Filed Jun. 23, 1980, Ser. No. 161,663

Int. Cl.[3] F23N *5/24*

U.S. Cl. 361—170 11 Claims



1. In a fuel-gas burning appliance system of the type including a fuel-gas burning appliance having an electrically activated automatic ignition device, and a fuel-gas supply distribution arrangement including a conduit for conducting fuel-gas from a fuel-gas supply to the appliance, the improvement comprising:

gas sensing means disposed outside of said distribution system and being operable to generate a sensing signal in response to the presence of fuel-gas;

control means coupled to said gas sensing means to generate a control signal in response to said sensing signal;

a latch-off safety switch connected to said ignition device and operable in response to said control signal to deactivate and maintain deactivated said ignition device until said switch receives a reset signal, reactivation of said ignition device being prevented until said reset signal is received by said switch, and

a distribution system gas shut-off valve disposed in said conduit and being switchable between an open state in which fuel-gas is permitted to pass through said conduit and a closed state in which fuel-gas is blocked from passage through said conduit, said shut-off valve including switching means connected to said control means and adapted to switch said control valve from said open to said closed state in response to said control signal;

whereby the presence of fuel-gas outside said distribution system at said gas sensing means will cause said fuel-gas burning appliance ignition system to be deactivated and the fuel supply to be shut off.

4,334,259

DISCHARGE/GROUND BUTTON

James M. Edwards, Santa Ana, Calif., assignor to Management Assistance Inc., New York, N.Y.

Filed Aug. 11, 1980, Ser. No. 177,255

Int. Cl.[3] H05F *3/00*; H01G *1/00*

U.S. Cl. 361—212 3 Claims

1. A grounding button for providing a conductive leak path between a conductor frame and an access door of an electrical cabinet comprising a core formed of an annulus of deformable resilient material having an inside diameter forming a central opening, a planar circular mounting plate having an outside diameter sized to be intermediate the inside and outside diameter of the annular core and having an upper and lower planar surface, a portion of the resilient core being in contact with and supported by the planar upper surface of the mounting plate, a layer of knitted wire mesh electrically connected to an upper surface of the mounting plate, at least partially surrounding the exterior of said resilient core and surrounding the lower surface of the mounting plate to form a continuous electrically conductive path so that both the conductive frame and access door will be in electrical contact with the knitted wire mesh

when the access door is closed, said grounding button being secured to the cabinet by a securing means to bring the knitted wire mesh surrounding the lower surface of the mounting plate into electrical conductive contact with a surface of the cabinet whereby when the access panel is closed the grounding button is deformed between the access panel and the conductive frame and both the access door and conductive frame are in electrical contact with the knitted wire mesh thereby creating direct electrical contact between the access door and conductive frame to provide a conductive leak path between the same.

4,334,260

WALL-TYPE INTERCOM STATION FOR DETENTION AND PENITENTIARY FACILITIES

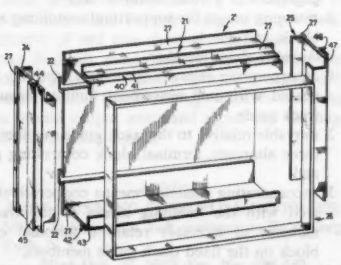
Ernst A. Schmelter, Lustenbergweg 5, and Bruno W. Simmert, Bruckner-Str. 35, both of D-4404 Telgte, Fed. Rep. of Germany

Filed Jun. 17, 1980, Ser. No. 160,189

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1980, 8006854[U]

Int. Cl.[3] H02B *1/04*

U.S. Cl. 361—360 18 Claims

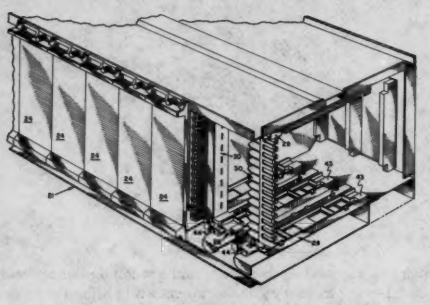


1. In a wall-type intercom station in a communications and reporting system for detection and penetentiary facilities, with a flush mounting box, a cover plate with sound penetration openings covering the box, sensor pushbutton switches arranged in the cover plate as well as fastening screws attaching the cover plate to the flush mounting box, the improvement comprising the flush mounting box forming profile elements and a front ring being installed in slots of the profile elements, whose front close-off edges are flush with the cover plate.

4,334,261
UNIVERSAL INPUT/OUTPUT SYSTEM CONSTRUCTION FOR PROGRAMMABLE CONTROLLERS

Roman Y. Gonzales, Andover, Mass., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Sep. 22, 1980, Ser. No. 189,948
Int. Cl.³ H05K *7/16*
U.S. Cl. 361—426 **15 Claims**



1. An expandable, multi-purpose input/output system interconnected with a central processor to form a machine controller interconnected with and operating external devices, comprising

A. a housing incorporating means for communicating with the central processor;

B. a printed circuit board incorporating

a. means for disengageably interconnecting said printed circuit board with the communicating means of the housing, and

b. a plurality of electrically independent contacts for communicating with the external equipment;

C. a pair of slider assemblies mounted to the housing in juxtaposed, spaced, cooperating, facing relationship, thereby forming an upper slider assembly and a lower sliding assembly, each of said slider assemblies comprising

a. a track guide member fixedly mounted to the housing, and incorporating

1. holding means for supportingly holding the printed circuit board,

2. movement limiting means for controlled sliding engagement of a slider member, and

3. retaining means for supportingly retaining a terminal block, and

b. a movable slider member

1. incorporating engagement means captively interconnected with said movement limiting means of the track guide,

2. movable relative to the track guide member between three alternate, terminal block controlling positions, and

3. incorporating retaining means cooperatively associated with the retaining means of the track guide member to movably retain a terminal connector block on the fixed track guide members,

D. a terminal connector block controllably mounted to the two fixed track guide members and comprising

a. a plurality of wire connection points for electrically connecting the external equipment to the input/output system, and

b. a plurality of quick disconnect contacts, with each of said contacts being independently conductively associated with one wire connection point; and

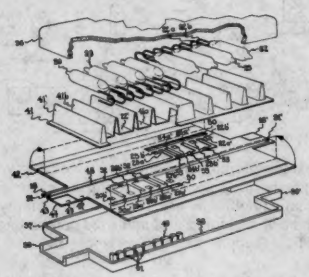
E. a connector panel incorporating a plurality of conductively independent contacts for electrically interconnecting the quick disconnect contacts of the terminal connector block with the plurality of electrically independent contacts of the printed circuit board;

whereby an input/output system is achieved wherein the external equipment wires are easily connected to the terminal connector block, the movement of which is fully controlled by the slider assembly, wherein the printed circuit board is quickly and easily disengageably inserted and interconnected with the central processor, and wherein complete electrical interconnection of the external equipment through the printed circuit board to the central processor is made quickly and easily without requiring disassembly of the external equipment wires for removal, replacement or repair of the printed circuit board.

4,334,262
FLASH LAMP ARRAY HAVING COMPOSITE CIRCUIT BOARD AND ELECTRIC SHIELD MEMBER

Edward L. Latos, Mentor, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 2, 1980, Ser. No. 183,626
Int. Cl.³ G03B *15/02*
U.S. Cl. 362—11 **8 Claims**



1. A multiple flash lamp array utilizing a multilayer circuit board and electrical shield member in the form of a conductive sheet having an electrically insulative surface layer deposited directly thereon with electrical circuitry being deposited on said insulative surface layer to sequentially fire a plurality of high voltage flash lamps operatively associated therewith, and each of said flash lamps having a pair of lead-in wires extending therefrom with one of each pair of lead-in wires being electrically connected to the electrical circuitry and with the remaining lead-in wires being electrically connected to the underlying conductive sheet.

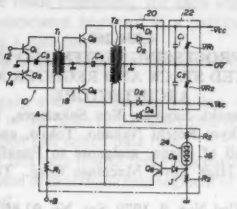
4,334,263
SEPARATELY EXCITED DC-DC CONVERTER HAVING FEEDBACK CIRCUIT WITH TEMPERATURE COMPENSATING EFFECT

Hiroo Adachi, Kawagoe, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 11, 1980, Ser. No. 129,207
Claims priority, application Japan, Mar. 13, 1979, 54-32262[U]
Int. Cl.³ H02P *13/22*
U.S. Cl. 363—25 **4 Claims**

1. A separately excited DC-DC converter, comprising voltage supply means for providing a first DC voltage; inverter means for converting said first DC voltage into an AC voltage in response to a drive pulse signal of a predetermined repetition frequency, said inverter means including at least one transformer for amplifying said AC voltage; rectifier means for rectifying the amplified AC voltage; a smoothing circuit for smoothing the rectified AC voltage into a second DC voltage which is higher than said first DC voltage; and feed-back means for modifying said first DC voltage in accordance with said second DC voltage, said feed-back means including a voltage divider connected to said smoothing circuit for divid-

ing said second DC voltage, the dividing ratio of said voltage divider varying in response to the ambient temperature, and variable resistance means inserted between said voltage supply means and said inverter means and including at least one resistor inserted between said voltage supply means and said inverter means, and a variable conductive element connected in parallel with said resistor and having conductivity varying in accordance with the divided voltage.

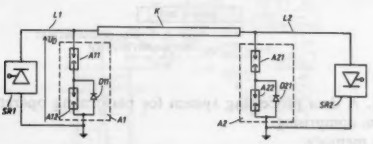


4,334,264

HIGH VOLTAGE DIRECT CURRENT TRANSMISSION APPARATUS

Lars Knudsen, Ludvika, Sweden, assignor to ASEA Aktiebolag, Vasteras, Sweden

Filed Dec. 29, 1980, Ser. No. 220,489
Claims priority, application Sweden, Dec. 28, 1979, 7910716
Int. Cl.³ H02H 7/00
U.S. Cl. 363—51 8 Claims



1. High voltage direct current (HVDC) transmission apparatus having a DC carrying line (L1, K, L2), the apparatus including voltage-limiting members (A1, A2) for limiting the line voltage (u_D) to a predetermined limiting level, characterised in that the limiting members (A1, A2) include means for causing the limiting level to be higher for voltage of one polarity than for voltage of the opposite polarity and to be different from zero for both polarities.

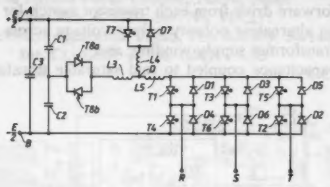
4,334,265

THYRISTOR INVERTER WITH INVERTER BRIDGE AND COMMON TURN-OFF CIRCUIT FOR INVERTER THYRISTORS

Kjeld Thorborg, Vesteras, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Filed Sep. 12, 1980, Ser. No. 186,802
Claims priority, application Sweden, Jan. 19, 1979, 7900490
Int. Cl.³ H02M 7/515
U.S. Cl. 363—72 6 Claims

1. An inverter connection with terminals for connection to a D.C. voltage source, said inverter connection having at least one inverter bridge, in which each valve branch comprises a thyristor and a diode connected in anti-parallel therewith, the inverter bridge being connected between the terminals in series with a valve consisting of a second thyristor and a second diode connected in anti-parallel therewith, the inverter bridge being further connected to a turn-off circuit for turning off all the thyristors, said turn-off circuit comprising a capacitor connection and a turn-off thyristor means, wherein the turn-off thyristor means comprises a thyristor connection, controllable in both directions, connected in series with at least one capacitor between a point which is located between the inverter bridge and the valve and at least one of the terminals, and in



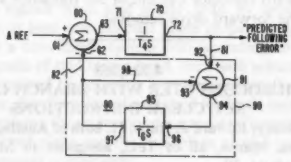
which two turn-off inductors are provided, one of which is connected in series with the valve and the other of which is connected in series with the inverter bridge.

4,334,266

NUMERICAL CONTROL SYSTEM WITH FOLLOWING ERROR MONITOR

Paul C. Merbach, Saxonburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 21, 1980, Ser. No. 142,521
Int. Cl.³ G05B 19/18
U.S. Cl. 364—167 10 Claims



1. A position monitoring system for monitoring the position of an axis in a machine controlled by a numerical control system and for providing a predicted following error signal indicative thereof, said numerical control system having a position control system for providing an output command signal, said position monitoring system comprising:

first integration means for providing said predicted following error signal as an output;

time delay means for time delaying the output of said integration means and for providing an output delay signal indicative of said time delayed output; and

negative feedback means for feeding back said time delay signal to said integration means, said negative feedback means including first summing means for summing a junction of said output command signal and the negative of said output delay signal.

4,334,267

FREE-RUNNING PUSH-PULL INVERTER

Sandor Miko, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 20, 1980, Ser. No. 198,419
Int. Cl.³ H02M 7/537
U.S. Cl. 363—133 6 Claims

1. A push-pull inverter power supply, comprising:

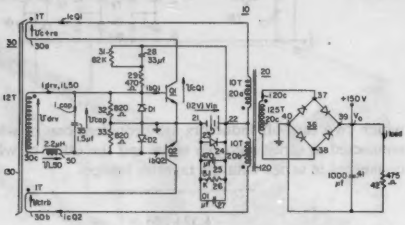
a power transformer having a plurality of windings including a primary winding and a supply winding;

first and second transistor switches coupled to said primary winding in a push-pull arrangement;

a saturable transformer having a control winding and having a drive winding coupled to a control electrode of each one of said first and second transistor switches to alternately apply forward drive to each switch, said saturable trans-

former control winding being supplied with a control current that reaches a magnitude that magnetically saturates the core of said saturable transformer to remove said forward drive from each transistor switch for developing an alternating polarity output voltage across said power transformer supply winding; and

a capacitance coupled to said saturable transformer drive



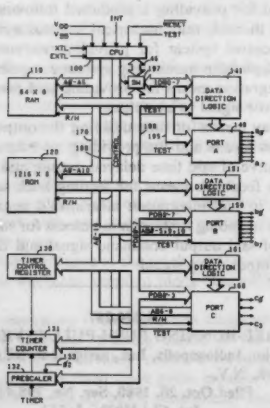
winding in such a manner that the voltage across said capacitance, upon the attainment of said control current magnitude, commences a resonant oscillation of a frequency sufficiently low so as to enable said capacitance to supply said drive winding with a magnetizing current that maintains saturation of said core beyond the cessation of forward collector current in the transistor switch subject to the forward drive removal.

4,334,268

MICROCOMPUTER WITH BRANCH ON BIT SET/CLEAR INSTRUCTIONS

Joel F. Boney; Edward J. Rupp, II, both of Austin, and James S. Thomas, Manor, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 1, 1979, Ser. No. 35,138
Int. Cl.³ G06F *9/32*
U.S. Cl. 364—200 **14 Claims**



1. In a data processing system comprising a memory having a plurality of storage locations for storing data and instructions and a processor for executing such instructions, a method of executing a conditional branch instruction, said instruction comprising an op code and a bit number, a first address portion designating a first storage location in said memory, and a second address portion designating a second storage location in said memory, said method comprising the steps of:

fetching the data stored in said first storage location using said first address portion of said instruction;

testing the state of the bit in the data fetched from said first storage location corresponding to said bit number; and

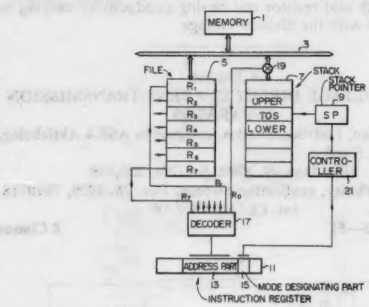
branching to said second storage location using said second address portion of said instruction if said bit is in a predetermined state.

4,334,269

DATA PROCESSING SYSTEM HAVING AN INTEGRATED STACK AND REGISTER MACHINE ARCHITECTURE

Yoshihisa Shibasaki, Sayama; Ken Sakamura, Tokyo; Waichi Sakamae, Tokyo; Koichi Nakano, Tokyo, and Hideo Aiso, Yokohama, all of Japan, assignors to Panafacom Limited, Yamato and High Level Machines Corp., Tokyo, both of, Japan

Filed Nov. 9, 1979, Ser. No. 92,859
Claims priority, application Japan, Nov. 20, 1978, 53-143101
Int. Cl.³ G06F *9/34, 13/00*
U.S. Cl. 364—200 **7 Claims**



1. A data processing system for performing operations on data, comprising:

a memory;

a general purpose register file, having a plurality of elements, operatively connected to said memory;

a stack, having a top, operatively connected to said memory;

an instruction register, operatively connected to said general purpose register file and said stack, for storing first and second operand specifiers, each of which includes an address part, for specifying an address of each of the data, and an operation code for designating an operation to be performed;

first means, operatively connected to said stack and said instruction register, for causing said top of the stack to correspond to at least one of said elements in the general purpose register file; and

second means, operatively connected to said stack and said instruction register, for controlling the operation of said stack, so that when said element, to which said top of the stack corresponds, is specified by each of said address parts, said top of the stack is selected by said first means and the operation of said stack is controlled by said second means.

4,334,270

SECURITIES VALUATION SYSTEM

Frederic C. Towers, 8033 Herb Farm Dr., Bethesda, Md. 20034

Filed Aug. 11, 1972, Ser. No. 279,781
Int. Cl.³ G06F *15/21*
U.S. Cl. 364—300 **5 Claims**

1. The method of operating a general purpose digital computer having a plurality of data files, to allow a plurality of users to simultaneously retrieve information, while allowing the computer operator to update the information in said data files, comprising:

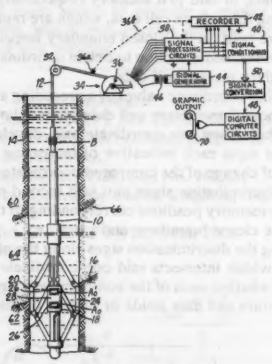
(a) providing each of said data files with a keyword through which said file is accessed,
(b) ordering said data in said data files in a sorted sequence, each data file having a separate sorted segment of data,
(c) providing an index file with a sequential string of correspondence fields containing, for each segment of sorted data, an associated keyword in a particularly sequence identifying a data file,
(d) providing a spare data file for editing the data on said files,
(e) immediately after said editing routine, exchanging the keywords in the fields of the index files corresponding to said unedited and edited data files,
(f) accessing said data files to retrieve a particular record by a comparison to determine said segment of data containing said record,
(g) searching said index file to determine the data file containing the segment of data including said record,
(h) reading the correspondence field of said segment of data to retrieve the keyword of the data file having the most recently edited version of said data segment,
(i) accessing said data file and retrieving said data record.

4,334,271

WELL LOGGING METHOD AND SYSTEM

Christian M. Clavier, Paris, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Feb. 25, 1980, Ser. No. 124,527
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—422 **21 Claims**



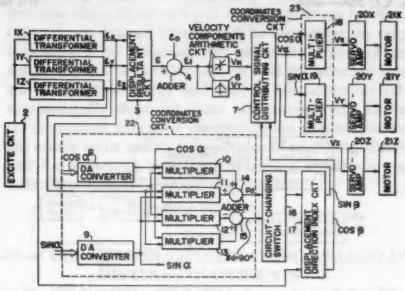
1. A machine method of exploring a subsurface earth formation comprising the steps of:
producing a respective well log for each of the paths along a borehole in the earth formation which are logged by respective well logging devices carried by a multipad investigating tool moved through the borehole;
producing a set of a dip signal and an azimuth signal for each of a number of assumed bedding surfaces which interest the borehole at a given depth at different attitudes;
for each given one of said assumed bedding surfaces, combining those portions of the logs which have selected relationships to the intersections of the log paths by the given assumed bedding surface to produce an electrical signal related to the mutual degree of fit of the combined log portions; and
utilizing said degree-of-fit signals to produce a tangible record of the attitude of an assumed bedding surface which intersects the borehole at the given depth and tends to correspond in attitude to a feature of the earth formation.

4,334,272

TRACER CONTROL SYSTEM

Ryoji Imazeki, and Etsuo Yamazaki, both of Hachioji, Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Feb. 4, 1980, Ser. No. 118,217
Claims priority, application Japan, Feb. 9, 1979, 54-14098
Int. Cl.³ G06F *15/46*; G05B *19/33*
U.S. Cl. 364—474 **6 Claims**



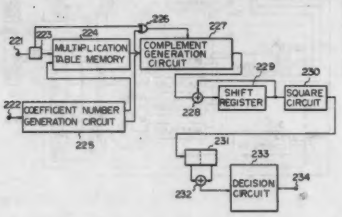
1. A tracer control system for controlling the relative position of a tracer head with respect to a model to be traced by displacement signals from said tracer head by moving said tracer head in at least one selected plane perpendicular to the X-Y plane in a coordinate system corresponding to the displacement signals of said tracer head, each said selected plane being predetermined by selecting a corresponding feed axis in said X-Y plane, the direction of each said feed axis being determined by specifying the corresponding angle of intersection of each said selected plane and the X-Z plane of said coordinate system, said system comprising:
means for providing input signals comprising selected trigonometric functions of each said angle of intersection;
a first coordinate conversion circuit comprising multipliers for selectively multiplying said input signals representative of each said angle of intersection with the respective displacement signals of the tracer head corresponding to the X and the Y axes, and adding means for selectively adding together output signals from the multipliers to output each respective component of the resultant displacement signal along each said respective selected feed axis in the X-Y plane;
a displacement direction index circuit for outputting selected trigonometric functions of the angle between the X-Y plane and the projection of said displacement signal in said at least one selected plane, said index circuit comprising means for utilizing the output from the first coordinate conversion circuit corresponding to said at least one selected plane and the tracer head displacement signal along the Z-axis to provide said output of the index circuit;
a control signal distributing circuit which is supplied with a normal velocity signal and a tangential velocity signal derived from the resultant displacement signal corresponding to the tracer head displacement signals along the X-, Y- and Z-axes and the output signal from the displacement direction index circuit to provide a velocity signal component along said at least one feed axis and a velocity signal component along the Z-axis for said tracing of said model in said at least one selected plane;
a second coordinate conversion circuit composed of multipliers for multipying the feed axis velocity signal from the control signal distributing circuit and the signals representative of the direction of said at least one selected feed axis in the X-Y plane, and means for distributing control signals indicative of the corresponding feed rates along the X- and Y-axes in accordance with the signals representative of the direction of the at least one selected feed axis.

4,334,273

SIGNAL PROCESSING SYSTEM USING A DIGITAL TECHNIQUE

Yoshikazu Ikeda, Tama, Japan, assignor to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Apr. 17, 1980, Ser. No. 140,449
Claims priority, application Japan, Apr. 24, 1979, 54-49732; May 14, 1979, 54-58109; May 19, 1979, 54-61030
Int. Cl.³ G01R 23/02; G06F 15/332
U.S. Cl. 364—484 6 Claims



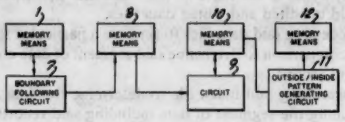
1. A signal detection system for detecting a particular frequency among a plurality of frequencies, said system comprising an input terminal receiving said plurality of frequencies including the particular frequency, a pair of multipliers for multiplying the input signal and a pair of reference signals which are orthogonal to each other and have the same period as that of the particular frequency, a pair of accumulators for accumulating the outputs of each of said multipliers, a coefficient number generator is provided for generating a plurality of groups of sequence numbers which are synchronized with a sample pulse for sampling the input signal, and said sequence of numbers has the period M_s which is the quotient T_c/T_s, where T_s is the duration for sampling the input signal and T_c is the common multiple of said T_s and the period T_f of each reference frequency signal, and is incremented or decremented by the step of M_1 which is the quotient T_c/T_f, a pair of square circuits for squaring the output of each said accumulators, an adder for summing the outputs of said square circuits, a decision circuit for comparing the output of said adder with a predetermined threshold value and detecting the particular frequency when the output of the adder is larger than the predetermined threshold value, and an output terminal connected to the output of said decision circuit for providing an output when said decision circuit detects the particular frequency, wherein said multiplier has a memory which stores the product of the sampled level of the input signal and the sampled level of the reference signal at an address which is defined by said sampled level of the input signal, and wherein the multiplication is performed by looking up in said memory according to the sampled level, the sequence of the input signal and the coefficient number of the reference signal, said memory storing the product of the sampled value of the input signal and the coefficient value which is obtained by sampling the reference signal in every sampling duration T_s at the address which is determined by the code of the sampled value of the input signal and the sequence number of said coefficient value, and said memory providing a product every time an input signal is applied to the memory from the address defined by the sampled value of the input signal and the coefficient value obtained from said coefficient number generator.

4,334,274

METHOD OF DETERMINING WHETHER OR NOT A REGION IN A PICTURE IS WITHIN A CLOSED BOUNDARY, AND AN APPARATUS THEREFOR

Takesi Agui; Masayuki Nakajima, both of Yokohama, and Koichi Iwata, Shizuoka, all of Japan, assignors to Kopia Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1979, Ser. No. 42,309
Claims priority, application Japan, Jul. 7, 1978, 53-082554
Int. Cl.³ H04N 1/40
U.S. Cl. 364—515 1 Claim



1. A method of determining whether or not a picture cell of a given picture is within a closed boundary, comprising the following steps:

scanning the given picture to store picture cell data thereof into memory positions of a first memory device;

storing non-boundary signs into memory positions of a second memory device, wherein non-boundary signs each indicates that the corresponding picture cell is not located on the closed boundary of the given picture, and wherein said memory positions of said second memory device correspond to the memory positions, filled by the picture cell data, of said first memory respectively;

following the picture cell data, which are representive of the picture cells on the closed boundary respectively, along a predetermined direction to obtain coordinate values of the boundary picture cell data;

comparing coordinate values of a preceding and next successive boundary picture cell data of each boundary picture cell data along one coordinate axis, developing discrimination signs each indicative of increasing, decreasing or lack of change of the compared coordinate values, writing the discrimination signs into said second memory device at the memory positions corresponding to the picture cells on the closed boundary; and

checking the discrimination signs along the other coordinate axis, which intersects said one coordinate axis, to determine whether each of the non-boundary signs corresponds to picture cell data inside or outside of the closed boundary.

4,334,275

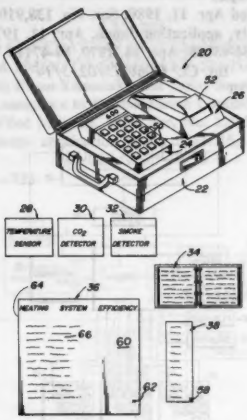
ENERGY AUDITING KIT

Marshall S. Levine, 538 Old Eagle School Rd., Wayne, Pa. 18087

Filed Sep. 11, 1980, Ser. No. 186,077
Int. Cl.³ G06F 15/20, 3/12
U.S. Cl. 364—551 20 Claims

1. A portable kit for on site auditing of the energy consumption characteristics of a building having a heating system and for providing a permanent, written record of said audit, said kit comprising audit form means including first and second areas, each of said first areas having indicia preprinted thereon at predetermined spaced locations from one another, each of said second areas being located immediately adjacent a respective first area and arranged for mounting a section of a printer output strip thereon, measuring means for measuring various parameters relating to building energy consumption and computing means including input means and printer means, said input means being arranged to provide input data in the form of said measured parameters and other source data to said computing means for analysis, said printer means operating in response to said computing means to produce an output strip

having plural groups of indicia printed thereon, with the indicia of each of said groups being disposed at predetermined spaced locations from one another within said group, said strip being arranged to be severed into plural sections, with each section containing a respective group of indicia, each of said

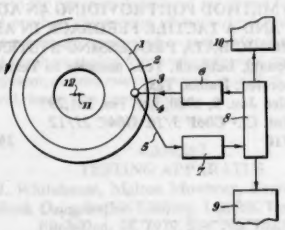


strip sections being arranged for mounting and securement within an associated second area on said form means so that the indicia printed on said strip section align with the indicia preprinted on said form means to provide a readily readable, permanent report identifying various energy consumption characteristics of said building.

4,334,276
DISC ECCENTRICITY MEASURING MEANS

David F. Turnbull, Glenrothes, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

Filed Jul. 10, 1980, Ser. No. 168,851
Claims priority, application United Kingdom, Jul. 19, 1979, 7925196
Int. Cl.[3] G06F *15/20;* G11B *7/00*
U.S. Cl. 364—561 8 Claims



1. Apparatus for measuring the eccentricity between a desired operating position of a removable disc and a disc file and the actual position in which the disc has been filed wherein the removable disc has a plurality of concentric data storage tracks, comprising:

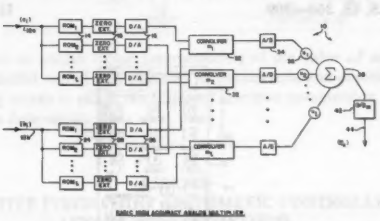
a first part associated with said removable disc for providing information with respect to the distance between the actual center of rotation of said removable disc and the centroid of said concentric data tracks, said first part including a circular servo track on said removable disc, said circular servo track including a circular null line which has the same centroid as said concentric data tracks, said circular servo track providing servo track signals which contain information indicative of the radial distance between the site where the signal is picked up and the position where said pick up site would by symmetrically disposed about said circular null line; and,

a second part integral with said apparatus for receiving said distance indicating information from said first part and for providing an output indicative of whether said distance indicated by said distance indicating information exceeds a predetermined distance, said second part including (a) transducing means for recovering signals from said removable disc, (b) servo track decoding means for decoding said servo track signals and for providing an output indicative of the radial distance between the zone of interaction on said removable disc of said transducing means and the position where said zone of interaction would be symmetrically disposed about said circular null line and (c) interpreter means for computing the distance between the means value and the actual value of said radial distance and for providing an output indicative of whether said difference exceeds a predetermined limit.

4,334,277
HIGH-ACCURACY MULTIPLIERS USING ANALOG AND DIGITAL COMPONENTS

James W. Bond, and Harper J. Whitehouse, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 837,342, Sep. 28, 1977, abandoned. This application Dec. 11, 1978, Ser. No. 968,603
Int. Cl.[3] G06F *7/72, 7/52;* G06J *1/00*
U.S. Cl. 364—703 9 Claims



1. An apparatus for multiplying two sequences of N digital numbers a_i and b_i, which may represent signal pulses of various amplitudes, comprising:

a first plurality of t read-only memories (ROMs), having a common input adapted to receive the sequence of numbers a_i, each ROM coding the numbers a_i into $a_{j,i}=a_j$ modulo m_i, with $0 \leqq a_{j,i} \leqq m_i-1$;

a first plurality of t extending means, an input of each connected to an output of a read-only memory, for extending the digital signal with N-1 zero values;

a first plurality of t digital-to-analog (D/A) converters, an input of each being connected to an output of a zero extender, for converting the digital quantity received from the extender into its corresponding analog value;

a second plurality of t read-only memories (ROMs), having a common input adapted to receive the sequence of numbers b_i, each ROM coding the numbers b_i into $b_{j,i}=b_j$ modulo m_i, with $0 \leqq b_{j,i} \leqq m_i-1$;

a second plurality of t extending means, an output of each connected to an output of a read-only memory of the second plurality, for extending the digital signal with $N-1$ zero values;

a second plurality of t digital-to-analog (D/A) converters, an input of each being connected to an output of a zero extender of the second plurality, for converting the digital quantity received from the extender into its corresponding analog value;

a plurality of t means for convolving two input analog signals, one from each of the first and second D/A converters, the output of each convolving means being an analog

convolved signal, approximately equal to the convolution $(a_{j,i}) * (b_{j,i})$ modulo m_i;

a plurality of t analog-to-digital (A/D) converters, each having its input connected to the output of one of the convolvers, for converting the analog signal back to digital form;

a plurality of t means for multiplying by an integer u_i, each means having an input connected to an output of an A/D converter, the integer u_i being defined by the relationship $u_i=1 \bmod m_i$ and $u_j=0 \bmod m_j$ for $j \neq i$, where the m_i represent integers and the u_i represent integers pairwise relatively prime;

means for summing, whose input comprise the t multiplying means; and

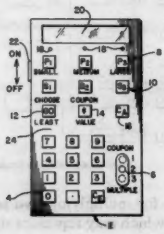
means, whose input is connected to the output of the summing means, for reducing the output of the summing means to a value between $0 \leqq m(=m_1\ m_2 \ldots m_t) - 1$ congruent to the output modulo m.

4,334,278

SHOPPERS COUPON CALCULATOR

Robert A. Marmon, 339 N. Latches La., Merion Station, Pa. 19066

Filed May 6, 1980, Ser. No. 147,002
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—709 **11 Claims**



1. An apparatus for determining the most economical purchase among products available in at least two sizes, and at different prices, in conjunction with a price reduction product coupon, comprising:

(a) a first register for storing numerical values corresponding to the product prices, the product sizes and the value of the coupon;

(b) a keyboard for entering data corresponding to the numerical values;

(c) means for deducting the stored coupon value from each of the stored prices, providing adjusted prices;

(d) an arithmetic unit for calculating price/size ratios corresponding to each of the adjusted prices and the stored sizes, the unit providing a numerical ratio for each of the product sizes which reflects the price, less the coupon value, the difference divided by the corresponding product size;

(e) a second register for storing the numerical ratios;

(f) a value comparator for determining the smallest of the numerical ratios;

(g) means for selecting the smallest numerical ratio as an output; and,

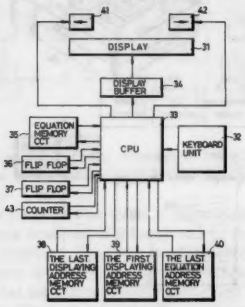
(h) an indicator corresponding to each product size, one of which indicators displays the selected output of the value comparator.

4,334,279

DISPLAY DEVICE FOR ELECTRONIC CALCULATORS OR THE LIKE

Kazumitsu Miyakoshi, and Koji Maekawa, both of Yamatokoriyama, Japan, assignors to Sharp Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1980, Ser. No. 138,910
Claims priority, application Japan, Apr. 11, 1979, 54-44611; Apr. 12, 1979, 54-45858; Apr. 16, 1979, 54-47119
Int. Cl.³ G06F *15/02, 3/14*
U.S. Cl. 364—710 **12 Claims**



1. A display device for an electronic calculator for calculating a result according to a predetermined algebraic equation stored therein, comprising:

means for storing at least two types of algebraic expressions which are entered externally;

means responsive to the storing means for detecting a space which separates the two algebraic expressions;

means responsive to the detecting means for terminating a first indication of data representing the first algebraic expression just before the position of the space; and

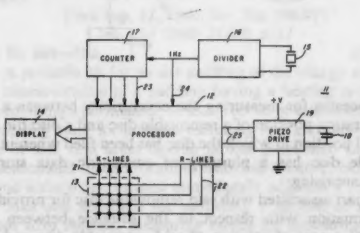
means responsive to the detecting means for initiating a second indication of data representing the second algebraic expression following the space.

4,334,280

SYSTEM AND METHOD FOR PROVIDING AN AUDIBLE SOUND AND A TACTILE FEEDBACK IN AN ELECTRONIC DATA PROCESSING SYSTEM

Wylie W. McDonald, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 9, 1980, Ser. No. 161,297
Int. Cl.³ G06F *3/16*; G04C *21/12*
U.S. Cl. 364—710 **35 Claims**



1. In an electronic data processing system having manually operable input means, means for providing an audible sound and a tactile feedback to a user when said input means is operated, comprising:

(a) control means responsive to a first electrical signal indic-

ative of the operation of said input means for generating a control signal; and

(b) transducer means responsive to said control signal for being excited into mechanical motion to generate an audible sound and provide tactile feedback for the user.

4,334,281

COMMAND GENERATION SYSTEM FOR GENERATING A SMOOTH COMMAND SIGNAL

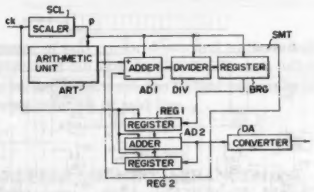
Ryoji Imazeki; Etsuo Yamazaki, and Takao Sasaki, all of Hachioji, Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Mar. 12, 1980, Ser. No. 129,562

Claims priority, application Japan, Mar. 15, 1979, 54-30372

Int. Cl.[3] G05B *19/25*

U.S. Cl. 364—723 5 Claims



1. A command generation system, operatively connected to receive a clock signal including clock pulses, which periodically calculates values of a digital quantity at known time intervals and converts the calculated result to analog form to issue a command, said command generation system comprising:

scaler means, operatively connected to receive the clock signal and having a predetermined scaler integer value N, for generating a timing signal when the number of clock pulses received divided by the predetermined scaler value N results in an integer;

means, operatively connected to said scaler means, for obtaining a difference value between current and previous calculated values of the digital quantity and for outputting said difference value divided by N whenever the timing signal is received; and

an adder, operatively connected to receive the clock signal, for adding the output from said difference value obtaining means to the previous calculated result and for generating an added result at the receipt of each clock pulse; and

means, operatively connected to said adder for converting the added result to analog form, whereby said command generation system, at time intervals equal to 1/N of the known time interval, issues the command.

4,334,282

TESTING APPARATUS

David J. Whitehouse, Melton Mowbray, England, assignor to The Rank Organisation Limited, London, England

Filed Dec. 14, 1979, Ser. No. 103,591

Claims priority, application United Kingdom, Dec. 14, 1978, 48601/78

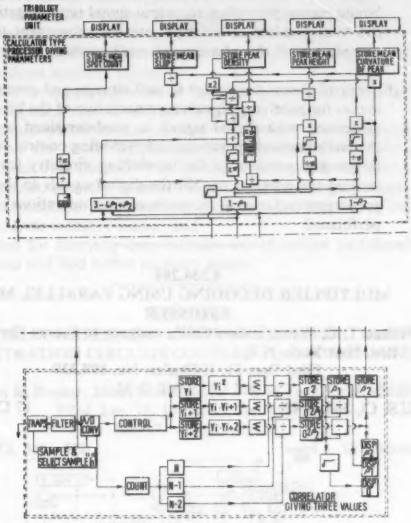
Int. Cl.[3] G06F *15/336;* G06G *7/19*

U.S. Cl. 364—728 5 Claims

5. Apparatus for processing an input signal representing a variable quantity to devise the value of a selected one of a plurality of parameters characterising that quantity, said apparatus comprising:

a correlator arranged to receive said input signal and to generate and store three data signals respectively representative of the value of the autocorrelation of the input signal at the origin of the autocorrelation, at a distance spaced from said origin by a predetermined sampling interval, and at a distance spaced from said origin by twice said sampling interval, the correlator being further arranged to generate a fourth data signal representative of said sampling interval,

signal combining means connected to receive said four data signals and arranged to selectively combine them to derive an output signal representative of the value of said selected one of said plurality of parameters, and combining means to effect the required selective combination of the data signals.



4,334,283

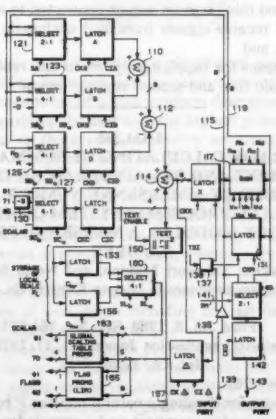
ADAPTIVE FIXED POINT ARITHMETIC CONTROLLER APPARATUS AND METHOD

Sam M. Daniel, Tempe, and Richard P. Kuivila, Phoenix, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jun. 13, 1980, Ser. No. 159,036

Int. Cl.[3] G06F *7/38*

U.S. Cl. 364—744 10 Claims


SELECT 2-1
LATCH A
LATCH B
LATCH C
LATCH D
SELECT 4-1
LATCH
SELECT 2-1
SELECT 4-1
LATCH
LATCH
LATCH
LATCH
SELECT 4-1
SELECT 2-1
LATCH
LATCH
LATCH
LATCH

a digital processor having bit-shifting circuitry therein comprising:

(a) storage and combining means having a plurality of inputs for receiving a plurality of digital signals thereon representative of bit-shifts accomplished in a plurality of mathematical operations in the processor, said storage and combining means providing an output signal representative of the total number of bit-shifts present subsequent to the completion of the plurality of mathematical operations, and

(b) control means connected to said storage and combining means for receiving signals representative of the bit-shifts associated with digital signals at predetermined ones of the mathematical operations and providing control signals to selected portions of the bit-shifting circuitry for controlling the portions to shift the digital signals so that the predetermined ones of the mathematical operations can be performed.

4,334,284

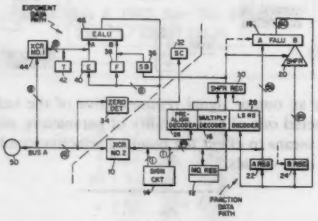
MULTIPLIER DECODING USING PARALLEL MQ REGISTER

Wilson T. C. Wong, Irvine, Calif., assignor to Sperry Corporation, New York, N.Y.

Filed Dec. 31, 1979, Ser. No. 108,339

Int. Cl.³ G06F *7/52*

U.S. Cl. 364—748 **17 Claims**



1. A floating point processor (FPP) architecture which permits multiple bit shifting, comprising,

first register means for storing a multiplier signal,

decoder means connected to receive signals from said first register means,

arithmetic logic circuit means connected to receive signals from and supply signals to said decoder means,

second and third register means connected to supply signals to and receive signals from said arithmetic logic circuit means, and

source means for supplying signals to and receiving signals from said first and second register means.

4,334,285

DIVIDER FOR CALCULATING BY SUMMATION THE QUOTIENT AND REMAINDER OF AN INTEGER DIVIDED BY A MERSENNE NUMBER AND A PARALLEL PROCESSOR SYSTEM COMPRISING MEMORY MODULES, A MERSENNE PRIME IN NUMBER

Kenji Kawakita; Takenori Makino, and Norio Harada, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1980, Ser. No. 166,877

Claims priority, application Japan, Jul. 11, 1979, 54-87826

Int. Cl.³ G06F *7/52*

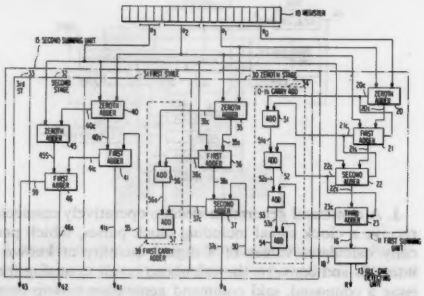
U.S. Cl. 364—761 **10 Claims**

1. A divider for dividing a natural number P by a Mersenne number to provide a quotient and a remainder, said natural number P being given by a k-digit number on the basis of a preselected radix 2^n, where n represents an integer that is greater than unity and is used to represent said Mersenne number as (2^n-1), as:

$$P=a_{k-1}(2^n)^{k-1}+a_{k-2}(2^n)^{k-2}+\ldots+a_2(2^n)^2+a_1(2^n)+a_0$$

where a_{k-1}, a_{k-2}, . . . , a_2, a_1, and a_0 represent coefficients, each of said coefficients being not less than zero and being less than said preselected radix, at least one of said coefficients being not less than unity, said divider comprising:

first summing means for summing said coefficients a_{k-1}, a_{k-2}, . . . , a_2, a_1, and a_0 to provide an eventual sum which is not less than zero and is less than said preselected radix, said first summing means comprising a plurality of adders connected in cascade, each of said adders providing a sum given by a carry multiplied by said preselected radix and



a sum portion that is not less than zero and is less than said preselected radix, the last adder providing said eventual sum;

all-one detecting means connected to said first summing means for examining whether or not said eventual sum is equal to said divisor, to provide a zero as said remainder and an additional carry equal to unity when said eventual sum is equal to said divisor and to otherwise provide said eventual sum as said remainder with said additional carry rendered equal to zero; and

second summing means connected to said first summing means and said all-one detecting means for summing $a_{k-1}(2^n)^{k-2}+(a_{k-1}+a_{k-2})(2^n)^{k-3}+\ldots+(a_{k-1}+a_{k-2}+\ldots+a_2)(2^n)+(a_{k-1}+a_{k-2}+\ldots+a_2+a_1)$, all the carry given by said first summing means, and said additional carry to provide said quotient.

4,334,286

DATA ENTRY APPARATUS FOR ENTERING TABULAR DATA ROW BY ROW AND COLUMN BY COLUMN

Shaun C. Kerigan; Brian D. Key, both of Winchester, and James Smith, Southampton, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 2, 1979, Ser. No. 26,618

Claims priority, application United Kingdom, Aug. 14, 1978, 33220/78

Int. Cl.³ G06F *3/023, 3/12*

U.S. Cl. 364—900 **1 Claim**

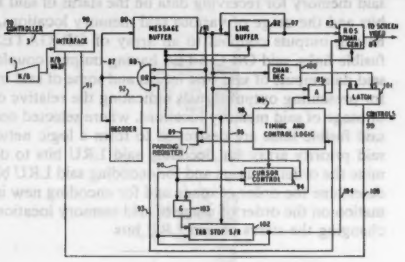
1. In a data entry apparatus including (a) a keyboard having alphanumeric character keys, a tab key and a code key, (b) a display including a cursor movable upon depression of said character and tab keys, and (c) a tab rack for storing set tab stops about which tables are to be entered, a keystroke saving method of entering lines of tables both row by row and column by column, said method comprising:

(a) entering a line of a table along one print line by depressing said character keys; and

(b) depressing said tab key following entering said line to cause movement of said cursor to the right along said one

print line to the next set tab stop if lines of different tables are to be entered row by row;

(c) depressing both said tab key and said code key to cause



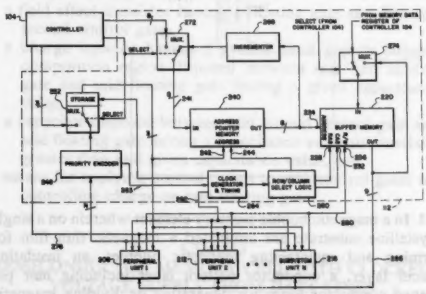
movement of said cursor down and to the left directly to the nearest set tab stop on a next print line following said one print line if the next line of said table is to be entered following entering of said line.

4,334,287

BUFFER MEMORY ARRANGEMENT

Gregory B. Wiedenman, Sandy, and Phillip W. Marsh, Granger, both of Utah, assignors to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 12, 1979, Ser. No. 29,305
Int. Cl.[3] G06F *3/00*
U.S. Cl. 364—900 **9 Claims**



1. A buffer memory arrangement for use in a system having a controller that controls a plurality of peripheral units, said controller being adapted to produce a plurality of control and address signals, including an initial address word for each peripheral unit, and each of said peripheral units being adapted to produce a request signal when it desires to supply or receive data and also to produce a corresponding write or read signal, said buffer memory arrangement including:

buffer memory means for receiving data from or supplying data to said peripheral units in response to write or read signals respectively, said data being stored in or read from locations specified by address data words;

address memory means including a plurality of memory locations, each of said memory locations being dedicated to a different peripheral unit and being adapted to store an address data word identifying a specific location in the buffer memory means, and to supply the address data word to said buffer memory means in response to a received identity signal;

priority encoder means coupled to said peripheral units and responsive to request signals received from said peripheral units for producing an identity signal which identifies a highest priority requesting peripheral unit;

means for supplying the identity signal produced by said priority encoder means to said address memory means;

means for supplying an address data word to a memory location of said address memory means identified by said identity signal;

address data word incrementing means for incrementing the address data word supplied by the address memory means to said buffer memory means, and for supplying said incremented address data word back to the means for supplying an address data word to a memory location of said address memory means;

means for supplying write or read signals from the identified peripheral unit to said buffer memory means;

first multiplexer means responsive to select control signals from the controller for supplying an address data word either from the controller or said incrementing means to a specific memory location of said address memory means as specified by said received identity signal supplied to the address memory means; and

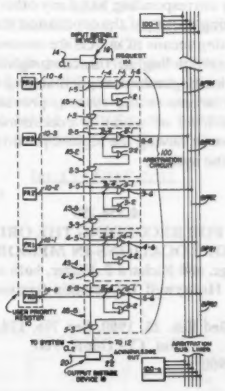
means for carrying data between the identified peripheral unit and said buffer memory means.

4,334,288

PRIORITY DETERMINING NETWORK HAVING USER ARBITRATION CIRCUITS COUPLED TO A MULTI-LINE BUS

Robert K. Booher, 24001 Muirlands, #395, El Toro, Calif. 92630

Filed Jun. 18, 1979, Ser. No. 49,729
Int. Cl.[3] G06F *9/46*
U.S. Cl. 364—900 **12 Claims**



1. In a system to be shared by a plurality of users, each of which users being provided with respective priority numbers, the relative magnitudes of which numbers determining a priority order for enabling the user with the highest priority number to gain access to the system, a priority arbitration network wherein each competing user for the system has a priority arbitration circuit respectively connected between a user register means that stores signals which correspond to bits of a coded representation of the user's priority number and multi-line bus line means, said bus line means being coupled to the arbitration circuit of every user, each user priority arbitration circuit comprising:

a plurality of serially interconnected arbitration stages, at least some of said stages including at least first, second, and third signal gating means,

said first signal gating means connected between said user register means and one line of said multi-line bus means, said first gating means receiving at input terminal means thereof a signal from said register means that is representative of one bit of a user's coded priority number, said one bus line being common to the first gating means of the

corresponding arbitration stage of every user's arbitration circuit, said first gating means also receiving at the input terminal means thereof a command signal whereby to cause said one common bus line to be driven from output terminal means of said first signal gating means to a signal level that is representative of the corresponding one bit of the highest assigned priority number of any user,

said second signal gating means having input terminal means connected to said register means and to said one bus line to receive signals therefrom, said second signal gating means comparing the magnitude of the signal level to which said one bus line is driven with the magnitude of the signal that is representative of the one bit of the user's assigned priority number, to thereby provide a particular output signal depending upon the relative magnitudes therebetween, and

said third signal gating means having input terminal means connected to output terminal means of said second gating means and to output terminal means of the third gating means of a preceding arbitration stage to receive signals therefrom, said third gating means providing from output terminal means thereof a command signal to be supplied to input terminal means of each of the first and third gating means of a succeeding arbitration stage for controlling the operations thereof, the command signal provided by said third gating means having either a first signal level when the magnitude of the bit of the user's priority number is not lower than that of any corresponding bit of any other competing user or a second signal level when the magnitude of the bit of the user's priority number is lower than that of any corresponding bit of any other competing user,

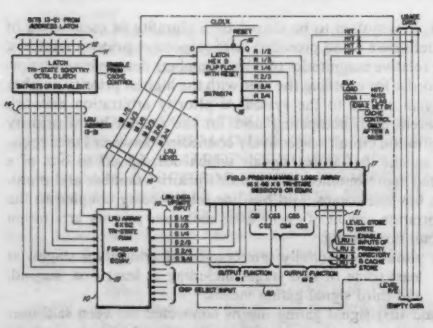
the third gating means of the arbitration stage, the first and second gating means of which are connected to receive a signal corresponding to the least significant bit of the highest priority number assigned among those users competing for access to the system, providing a command signal, the level of which is conditioned to selectively enable the user having the highest priority number to gain access to the system.

4,334,289

APPARATUS FOR RECORDING THE ORDER OF USAGE OF LOCATIONS IN MEMORY

Ronald E. Lange, and Richard J. Fisher, both of Phoenix, Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Feb. 25, 1980, Ser. No. 124,008
Int. Cl.³ G06F *7/00*
U.S. Cl. 364—900 **3 Claims**



1. An apparatus for recoding the relative order in time of usage of locations in a memory comprising:

(a) a first means for storing a plurality of LRU bits where there are a sufficient number of said LRU bits to encode therein the order of usage of the locations in said memory having data outputs and inputs;

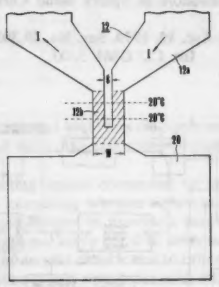
(b) a priority array of AND gates having inputs coupled by fusible links to said data outputs of said first means and to said memory for receiving data on the status of said LRU bits and the usage of various said memory locations, and having outputs coupled to an array of OR GATES by fusible links, said OR GATES having outputs coupled to said data inputs of said first means and some of said inputs for presenting output signals indicating the relative order of usage of said memory locations, where selected ones of said fusible links are destroyed to form a logic network, said priority array for decoding said LRU bits to determine the order of usage and for encoding said LRU bits to determine the order of usage and for encoding new information on the order of usage of said memory locations by changing the status of said LRU bits.

4,334,290

MAGNETIC BUBBLE MEMORY ELEMENT WITH HEAT SINK

Minoru Hiroshima; Toshio Futami, and Hirofumi Ohta, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 29, 1979, Ser. No. 42,995
Claims priority, application Japan, Jun. 16, 1978, 53-72157
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—1 **4 Claims**



1. In a magnetic bubble memory element wherein on a single crystalline substrate are laminated a magnetic thin film for forming and maintaining magnetic bubbles, an insulating spacer layer, a conductor pattern layer including hair pin shaped conductor loops for generating or dividing magnetic bubbles, an insulating layer, and a pattern layer including a magnetic bubble propagation circuit, in the above-mentioned order, the improvement wherein a heat sink pattern layer is integrally formed and coplanar with said conductor pattern layer, to form heat sinks extending from said hair pin loops each heat sink having a large coplanar area of said conductor material in thermal conductive contact with the tip of a loop by means of an integral conductive bridge which provides a wide heat conducting path from said tip to said large coplanar area without significant alteration of the path of flow of operating current around said loop.

4,334,291

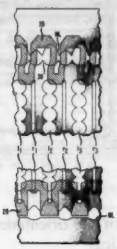
ION-IMPLANTED MAGNETIC BUBBLE MEMORY WITH DOMAIN CONFINEMENT RAILS

Joseph E. Geusic; Dirk J. Muehlner, both of Berkeley Heights, and Terence J. Nelson, New Providence, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 4, 1980, Ser. No. 184,115
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—36 **9 Claims**

1. A magnetic bubble memory comprising a layer of material

in which magnetic bubbles can be moved, a pattern of unimplanted regions in an otherwise ion-implanted area in said layer defining at least first and second propagation paths thereabout along which bubbles can be moved in response to a field reori-



enting cyclically in the plane of said layer, said memory being characterized by means comprising a protective rail between said propagation paths for preventing loss of information due to stripout therebetween.

4,334,292

LOW VOLTAGE ELECTRICALLY ERASABLE PROGRAMMABLE READ ONLY MEMORY

Harish N. Kotecha, Essex Junction, Vt., assignor to International Business Machines Corp., Armonk, N.Y.

Filed May 27, 1980, Ser. No. 153,359

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—182 **27 Claims**

1. A system comprising;
- a field effect transistor having a floating gate and first and second control gates,
- a charge injector having a graded band gap or stepped composition region disposed between said first control gate and said floating gate having a given capacitance value,
- a capacitor disposed between said second control gate and said floating gate having a capacitance value substantially greater than said given capacitance value, and
- means for applying control pulses to said control gates for controlling charge on said floating gate.

4,334,293

SEMICONDUCTOR MEMORY CELL WITH CLOCKED VOLTAGE SUPPLY FROM DATA LINES

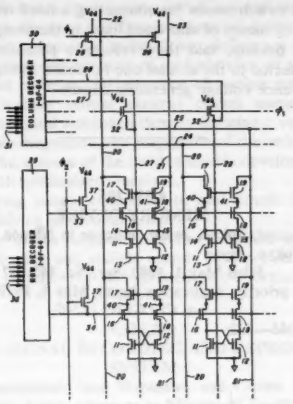
James E. Ponder, Cat Spring, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 925,893, Jul. 19, 1978, Pat. No. 4,209,851. This application May 12, 1980, Ser. No. 148,614

Int. Cl.³ G11C *7/00, 11/40*

U.S. Cl. 365—190 **8 Claims**

1. An array of rows and columns of identical static self-refresh memory cells, each cell comprising a pair of cross-coupled driver transistors and first and second pairs of coupling transistors, each of the transistors being an insulated-gate field-effect transistor of the same channel conductivity type having a source-to-drain path and a gate, each cell having a pair of storage nodes with no d.c. path from the storage nodes to a voltage supply, a plurality of pairs of complementary data lines providing the column lines for the array of cells, each of the first pair of coupling transistors having their source-to-drain paths connected between one of the data lines of a pair and one of the storage nodes of a cell, means including the second pair of coupling transistors for refreshing the pair of storage nodes during a first time period, a plurality of first conductive means providing array address lines for applying operating voltage to the gate electrodes of the second pair of transistors in each of the cells during said first time period, and second conductive means providing a row address line for applying operating voltage to the gate electrodes of the first pair of transistors in each of the cells during a second time period for a selected row in each operating cycle, the first conductive means not apply-



ing operating voltage to the control electrodes of said first pair of transistors during said second time period during a refresh cycle.

4,334,294

RESTORE CIRCUIT FOR A SEMICONDUCTOR STORAGE

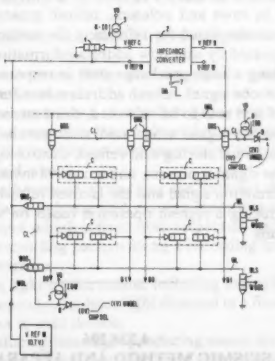
Klaus Heuber, Beoblingen, and Siegfried K. Wiedmann, Stuttgart, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 11, 1980, Ser. No. 167,560

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1979, 2929384

Int. Cl.³ G11C *7/00*

U.S. Cl. 365—203 **2 Claims**



1. A circuit for restoring an integrated semiconductor storage array having storage cells consisting of bipolar transistors (and PNP load devices) at cross-points of word lines and bit line pairs comprising:
- a reference voltage generator circuit including a current source connected to at least one reference storage cell and providing a first reference voltage;
- impedance converting means connected to said reference voltage generating circuit and receiving as an output said first reference voltage and providing a second reference voltage at a low impedance output;

first switch means connecting said second reference voltage, by means of said bit line pairs to the PNP load devices of the array storage cells;

second switch means for connecting a third reference voltage, by means of said word lines, to the array storage cell load devices, said third reference potential also being connected to the at least one reference storage cell in the reference voltage generating circuit.

4,334,295

MEMORY DEVICE

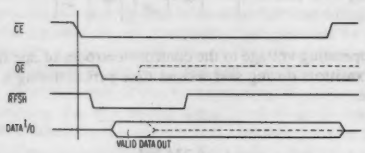
Akira Nagami, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed May 1, 1980, Ser. No. 145,537

Claims priority, application Japan, May 8, 1979, 54-56160

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—222 **19 Claims**



1. A memory device comprising a first terminal for receiving a row strobe signal, a second terminal for receiving a column strobe signal, a set of address terminals, a third terminal for receiving a refresh control signal, first means responsive to said row strobe signal for storing address signals applied to said address terminals as row address information, second means responsive to said column strobe signal for storing address signals applied to said address terminals as column address information, a memory cell matrix including memory cells arranged in rows and columns, refresh means responsive to said row strobe signal for refreshing the memory cells on the row designated by said row address information , said refresh means taking a reset precharge state in response to absence of said row strobe signal, refresh address means for designating an address of said row to be refreshed, third means for producing a confirmation signal when said reset precharge state ends, fourth means for storing said refresh control signal when said row strobe signal is present, and a control means responsive to said confirmation signal and the lacthed refresh control signal for introducing a refresh operation based on said refresh address means.

4,334,296

SEISMIC METHOD AND APPARATUS

Ernest M. Hall, Jr., Houston, Tex., assignor to Western Geophysical Co. of America, Houston, Tex.

Continuation of Ser. No. 887,165, Mar. 16, 1978, abandoned, which is a continuation-in-part of Ser. No. 783,531, Apr. 1, 1977, abandoned. This application Oct. 1, 1979, Ser. No. 81,729

Int. Cl.³ G01V *1/18*

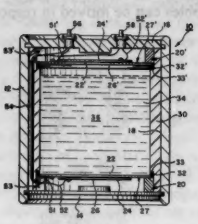
U.S. Cl. 367—180 **29 Claims**

1. A seismic detector comprising:

a housing including an internal chamber;

a fluid mass in the chamber; and

means for generating a pair of transducer signals in response to excitation of the fluid mass by seismic signals so that the vertical components of the seismic signals may be identified and processed separate from the horizontal compo-



nents regardless of the orientation of the housing to the gravitational vertical.

4,334,297

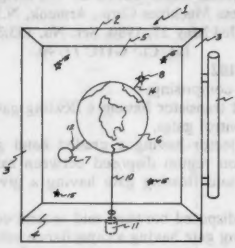
GLOBE CLOCK DEVICE AND METHODS OF MAKING AND USING THE SAME

Gerald D. Oros, 451 Olian, Hazelwood, Mo. 63042

Continuation-in-part of Ser. No. 28,260, Apr. 9, 1979. This application Jun. 23, 1980, Ser. No. 161,751

Int. Cl.³ G04B *19/26*

U.S. Cl. 368—18 **3 Claims**



1. A globe clock comprising,

housing means, said housing means provided with an enclosure comprising a vertical back wall and side walls and a top and bottom wall,

an earth sphere rotatably mounted in said enclosure, said earth sphere rotating on and about an axis which is essentially vertical and which is parallel to said back wall, the width of said walls proximate the diameter of said earth sphere,

a moon sphere rotatably mounted on a suspension arm within said enclosure means and disposed to orbit about said earth sphere, the axis of rotation of the moon sphere essentially perpendicular to said back wall and the axis of said earth sphere,

a satellite sphere rotatably mounted on a suspension arm within said enclosure means and disposed to orbit about said earth sphere, the axis of rotation of the satellite sphere essentially perpendicular to said back wall and the axis of said earth sphere,

first motor means operably mounted in said housing, connected to the axis of said earth sphere and disposed external to said enclosure,

second motor means operably mounted in said housing to the rear of the earth sphere and concealed from view by the earth sphere and connected to the axis of said moon sphere and the axis of said satellite sphere causing the moon sphere to rotate one revolution per 12 hours and causing the satellite to rotate one revolution per hour, said

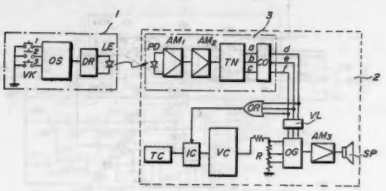
moon sphere and said satellite sphere disposed and functioning as the hour and minute indicia respectively.

4,334,298

WIRELESS SPEECH-SYNTHESIZER TIMEPIECE

Atsushi Asada, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 6, 1980, Ser. No. 127,849
Claims priority, application Japan, Mar. 9, 1979, 54-30728[U]
Int. Cl.[3] G04B *21/08;* H04M *1/00*
U.S. Cl. 368—63 1 Claim



1. A wireless speech synthesizer timepiece for developing audible sounds indicative of updated time information, comprising:

transmitting means for transmitting a signal having a particular frequency, said transmitting means including,

a plurality of volume selection key means for selecting a volume of said audible sounds and for energizing said wireless speech synthesizer timepiece to develop said audible sounds indicative of said updated time information in response to actuation thereof;

means connected to said volume selection key means for developing output signals having a plurality of different frequencies, each of the different frequencies of the output signals corresponding to one of the plurality of volume selection key means, and

means responsive to one of the output signals from the developing means for transmitting a signal having a frequency corresponding to the frequency of the output signal from the means for developing;

receiver means unattached to and remote from said transmitting means for receiving said signal from the means for transmitting and for developing said audible sounds in response thereto, the audible sounds having a volume corresponding to the frequency of the received signal, said receiver means including,

sensing means for sensing the presence of the signal transmitted by the means for transmitting and developing an output signal indicative thereof,

amplifying means connected to the sensing means for amplifying said output signal from the sensing means,

tuned circuit means connected to the amplifying means for developing a plurality of frequency signals tuned to the output signal from the sensing means, each of the frequency signals corresponding to one of the plurality of volume selection key means,

timekeeping means for developing an output signal indicative of said updated time information,

means responsive to one of said plurality of frequency signals from said tuned circuit means and connected to said timekeeping means for enabling the transfer of said updated time information from said timekeeping means to an output terminal,

audible output control circuit means connected to said output terminal of the means for enabling for developing a sequence of audible signals indicative of said updated time information transferred from said timekeeping means,

a plurality of series connected resistors connected to an output terminal of said audible output control circuit means, said resistors having taps interposed therebetween,

circuit means connected to each of said taps and responsive to the plurality of frequency signals from the tuned circuit means for selecting one of said taps corresponding to the received frequency signal from the tuned circuit means, the selected tap defining a resistance including one or more of said plurality of series connected resistors, the sequence of audible signals from the audible output control circuit means passing through said resistance thereby defining a voltage of a certain magnitude, the magnitude of the voltage defining the volume of the audible sounds developed by the speech synthesizer timepiece,

amplifying means connected to said circuit means for amplifying said voltage, and

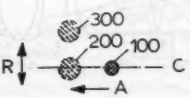
speaker means responsive to the amplified voltage for developing said audible sounds having a selected volume indicative of said updated time information.

4,334,299

OPTICAL SIGNAL RECORDING AND REPRODUCING SYSTEM

Satoshi Komurasaki; Isao Watanabe, and Osamu Ito, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1979, Ser. No. 87,302
Claims priority, application Japan, Oct. 24, 1978, 53-131367
Int. Cl.[3] G11B *7/00, 7/12*
U.S. Cl. 369—44 9 Claims



1. An optical signal recording and reproducing device for recording information on and reproducing information from a recording surface of a recording medium moving at a constant speed and direction with respect to said device, said device comprising:

a recording light source means for producing a recording laser light;

signal generator means for generating signal representing information to be stored;

modifier means connected to said first light source means for receiving the recording laser light and to said signal generator means for modifying said recording laser light in response to said signal;

first optical path means for directing and focusing the modified recording laser light on said moving recording surface at a recording spot which is fixed with respect to said device for forming a recording pattern along a recording track on said recording surface;

a reproducing light source means, including means for producing a first reproducing laser light directed in a fixed direction with respect to said device;

second reproducing laser light producing means for producing a second reproducing laser light and for varying the direction of said second reproducing laser light with respect to said device;

second optical path means for receiving said first and second reproducing laser light and directing and focusing said first reproducing laser light along said track on said recording surface at a first reproducing spot fixed with respect to said recording spot, and for directing and focusing said second reproducing laser light on said recording surface at a second reproducing spot which is movable with respect to said recording spot by a variation of the direction of said second reproducing laser light, and for collecting said first and

second reproducing laser light reflected from said recording surface and directing it;

optical sensor means for receiving said reflected first and second reproducing laser light collected and directed by said optical path means;

reproducing means connected to the optical sensor means receiving said reflected first reproducing laser light for reproducing the signal recorded on said recording medium and combination control and reproducing means connected to said optical sensor means for receiving the reflected second reproducing laser light for reproducing the signal recorded on said recording medium and producing a correction signal for actuating said second laser light generating means for varying the direction of said second reproducing laser light for moving said second reproducing spot toward the position of said recording track.

4,334,300

STIGMATIC OPTICAL DEVICE AND AN OPTICAL RECORDING HEAD EQUIPPED WITH SAID DEVICE

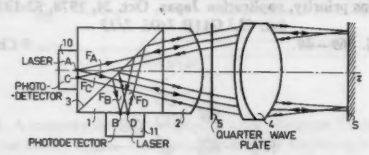
Louis Arquie; Claude Bricot; Jean-Claude Lehureau; Michel Thirouard; Jean-Pierre Le Merer, and Dominique Leterme, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 18, 1980, Ser. No. 208,005

Claims priority, application France, Nov. 21, 1979, 79 28694

Int. Cl.³ G11B *7/12*

U.S. Cl. 369—46 **11 Claims**



1. A stigmatic optical device for emission and reception of coherent radiations, comprising at least one semiconductor laser source and optoelectronic detection means, and a refracting optical block delimited by a first plane face and a convex face of spherical shape, one of the Weierstrass points of the spherical refracting surface formed by said convex face being located on said plane face, said plane face being perpendicular to the straight line which joins said Weierstrass point to the center of said convex face of spherical shape, the laser source being placed in the vicinity of said point.

4,334,301

OPTICAL READING APPARATUS WITH SCANNER LIGHT INTENSITY CONTROL

Hitoshi Kanamaru, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Division of Ser. No. 887,401, Mar. 16, 1978, abandoned, which is a division of Ser. No. 743,025, Nov. 18, 1976, Pat. No. 4,093,961. This application Aug. 25, 1980, Ser. No. 180,741

Claims priority, application Japan, Nov. 21, 1975, 50-139314

Int. Cl.³ G11B *7/12*

U.S. Cl. 369—116 **2 Claims**

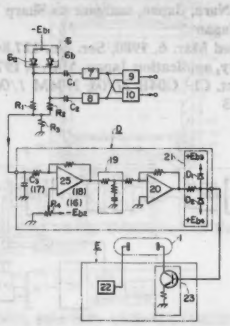
1. In an optical signal readout apparatus including a source of laser light, a rotary disc record, a photo detector, and an optical scanner for focusing light from the source onto the record and directing light reflected back from the record onto the photo detector, the improvements characterized by:

(a) means for extracting the low frequency and d.c. components from the photo detector output signal, said extracted components being proportional to the average light intensity incident on the photo detector,

(b) means for comparing the extracted components with a reference voltage to derive an error signal,

(c) means for regulating the intensity of the source of laser light in response to the error signal, to thereby maintain the light intensity on the photo detector substantially constant,

(d) means for compensating, amplifying and limiting the error signal to a predetermined range, to thereby prevent the burnout of the photo detector, and



(e) means for regulating comprises a transistor circuit for controlling the discharge current from the source of laser light.

4,334,302

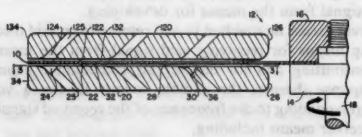
FLEXIBLE RECORDING DISC STABILIZING AND GUIDANCE SYSTEM

James M. Peppers, 800 W. Main #102, Arlington, Tex. 76013

Filed Jun. 2, 1980, Ser. No. 155,536

Int. Cl.³ G11B *5/52, 5/82, 25/04*

U.S. Cl. 369—261 **29 Claims**



1. In apparatus for operating a thin flexible signal disc at high rotational speeds, a system for aligning and stabilizing the rotating disc into a substantially undeviating path, comprising:

(a) a substantially annular stationary guide plate means defining a planar surface mounted parallel to one face of said rotating disc to provide a support and alignment reference for said disc;

(b) said planar surface comprising a plurality of concentrically disposed planar radial air stabilizing means and a plurality of circular air distribution passage means disposed intermediate said stabilizing means and vented to atmosphere along the length of each said passage means:

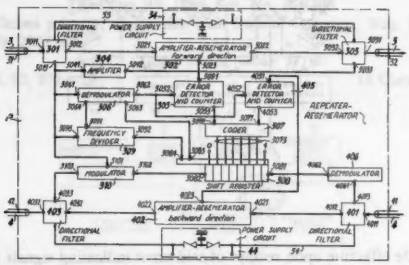
(c) each said air stabilizing means being of shape to serve as an air discharge nozzle means to direct passage of air radially out across said stabilizing means from said passage means as a substantially uniform air layer between said rotating disc and each said stabilizing means with the volume of said air increasing with additional air entering from each succeeding said passage means; and

(d) air pressure urging means on the opposing side of said disc to uniformly urge said rotating disc into continued contact with said supporting air layer.

4,334,303
MONITORING SYSTEM FOR TELECOMMUNICATION LINKS EQUIPPED WITH REPEATERS-REGENERATORS

Marcel R. Bertin, Sceaux; Patrick E. Boutmy, Paris; Gilbert J. Le Fort, and Jean G. Walraet, both of Lannion, all of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Apr. 18, 1980, Ser. No. 141,679
Claims priority, application France, Apr. 19, 1979, 79 09840
Int. Cl.[3] H04J 1/16
U.S. Cl. 370—13 7 Claims



1. Monitoring system for monitoring a performance factor of two-way repeaters-regenerators of a telecommunication link between a monitoring station and a monitored station, an exemplary performance factor being errors in the repeaters-regenerators,

said telecommunication link including a forward link for transmission of data signals in a first direction between the stations and a backward link for transmission of data signals in a second direction between the stations,

said monitoring station comprising:

sending means for sending information data and a low frequency signal modulated by control pulses through said forward link, and

receiving means for receiving information data from said monitored station and supervisory words indicative of the performance of said repeaters-regenerators, said supervisory words modulating the low frequency signal looped back in said repeaters-regenerators through said backward link;

each of said repeaters-regenerators comprising:

frequency separating means connected to said forward link for separating said control pulses modulating said low frequency signal from said forward information data,

means for detecting said performance of said repeater-regenerator with regard to errors made in an in-line code of said forward and backward information data during each modulating control pulse,

means for detecting the leading edge of said modulating control pulses,

means controlled by said control pulse detecting means for deriving a bit pattern from said detected performances after each detected control pulse,

a shift register

storing said derived bit pattern and a start bit and a stop bit as a supervisory word coupled to said shift register,

frequency dividing means responsive to said modulating control pulses and synchronized by said control pulse detecting means for generating advance pulses of said shift register having a frequency that is a submultiple of said low frequency signal;

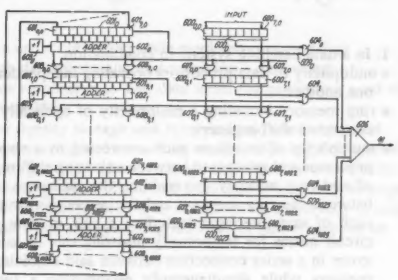
means receiving said moulated control pulses for modulating said low frequency signal by the bits of said supervisory word derived from said shift register at said submultiple frequency, and

means connected to said backward link for combining said supervisory word modulating said low frequency signal with said backward information data.

4,334,304
TIME DIVISION MULTIPLEX SWITCHING NETWORK WITH AN ASSOCIATIVE BUFFER STORE OF THE REGISTER COUNTER TYPE

Michel J. Servel, Le Rhu en Servel, Lannion, France (22300)

Filed May 8, 1980, Ser. No. 148,007
Claims priority, application France, May 11, 1979, 79 12080
Int. Cl.[3] H04J 3/00
U.S. Cl. 370—66 3 Claims



1. A time division multiplex switching network comprising:

in an input stage, a plurality of incoming multiplex highways and a supermultiplexer converting the said incoming multiplex highways into one incoming supermultiplex highway;

in an output stage, an out-going supermultiplex highway and a superdemultiplexer converting the said out-going supermultiplex highway into a plurality of out-going multiplex highways;

a circulating buffer store addressable by its content and comprising an input data word register and further data word registers forming a data word partial circulating store and an input random address register and further random address registers forming a random address partial circulating store, said data word partial circulating store and said random address partial circulating store operating synchronously and having associated data word registers and random address registers;

means for successively writing in the input data word register the words present in the incoming time-slots of the incoming supermultiplex highway;

means for successively writing in the input random address register addresses depending on the outgoing time slots to be connected to the incoming time slots;

means for steppedly incrementing by 1 the addresses written in the input random address register each time said addresses pass from a random address register to the next of the random address partial circulating store, and

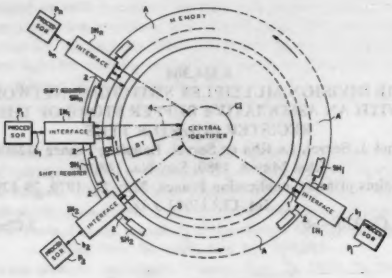
means for reading out the word stored in a data word register associated with a random address register when the incremented address stored therein has reached a predetermined value

4,334,305

DATA-HANDLING SYSTEM WITH OPERATIVELY INTERCONNECTED PROCESSORS

Gerardo Girardi, Turin, Italy, assignor to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Feb. 14, 1980, Ser. No. 121,445
Claims priority, application Italy, Feb. 15, 1979, 67323 A/79
Int. Cl.[3] H04J 3/08
U.S. Cl. 370—86 6 Claims



1. In a data-handling system, in combination:

a multiplicity of data processors operating independently of one another;

a ring memory including a multiplicity of cyclically interconnected shift registers;

a multiplicity of interfaces each connected to a respective processor and interposed between adjoining shift registers of said ring memory for enabling the exchange of data between the ring memory and the respective processor, each of said interfaces including a pair of data stores, circuit means for temporarily inserting one of said data stores in a series connection between said adjoining shift registers while simultaneously establishing a two-way connection between the other of said data stores and the respective processor, and switchover means for interchanging said connections in response to an instruction from the respective processor; and

a source of clock pulses common to all said interfaces for timing the circulation of data through said ring memory by way of a signal path including the series-connected data store of each of said interfaces.

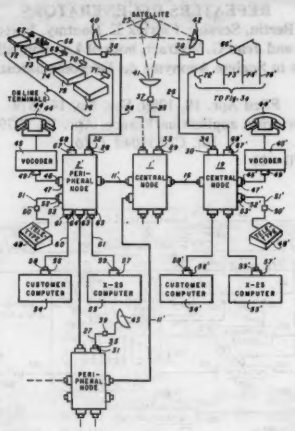
4,334,306

TRANSPARENT INTELLIGENT NETWORK FOR DATA AND VOICE

Mehmet E. Ulug, Ottawa, Canada, assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 912,118, Jun. 2, 1978, abandoned. This application May 15, 1980, Ser. No. 150,033
Int. Cl.[3] H04J 6/00
U.S. Cl. 370—94 10 Claims

1. An integrated terrestrial/satellite communications network having a plurality of peripheral star-connected and central communications nodes, a first plurality of terrestrial communications links connecting said central nodes directly, a second plurality of terrestrial communications links individually connecting said peripheral nodes to said central nodes, a satellite, means establishing communications links via said satellite directly between each of said central nodes, means for inputting data-representing network at one node and outputting said signals from said network through another node, means at said one node for selecting certain signals to be transmitted within the network by terrestrial communications links and other signals to be transmitted within the network by satellite links, means at said another node for checking said other signals for errors and in response to an error in one or more of said signals transmitted via said satellite to transmit back to said one node via terrestrial communications links exclusively an error indicating signal, and means at said one



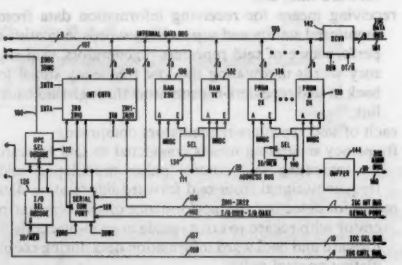
node effective upon receipt of said error indicating signals for retransmitting by terrestrial links exclusively said one or more of said signals.

4,334,307

DATA PROCESSING SYSTEM WITH SELF TESTING AND CONFIGURATION MAPPING CAPABILITY

David R. Bourgeois, Framingham; James A. Ryan, West Boylston, and Subhash C. Varshney, W. Roxbury, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 28, 1979, Ser. No. 108,047
Int. Cl.[3] G06F 11/00
U.S. Cl. 371—16 17 Claims



1. A logic test and configuration map control system in a data processing system including processor means and memory means comprising, in combination:

first test means responsive to said processor means for determining the functionality of a first section of said memory means;

inhibit means responsive to said first test means for issuing a control signal to said processor means to inhibit further operation of said logic test and configuration map control system if said first memory section is determined to function erroneously;

second test means in electrical communication with said first test means and said inhibit means for determining the functionality of a second section of said memory; and

means in electrical communication with said second test means for storing in a predetermined location of said first memory section the results of the operation of said second

test means indicating the functionality of said second memory section.

4,334,308

TEST FACILITY FOR ERROR DIAGNOSIS IN MULTI-COMPUTER SYSTEMS, PARTICULARLY IN MULTI-MICRO-COMPUTER SYSTEMS

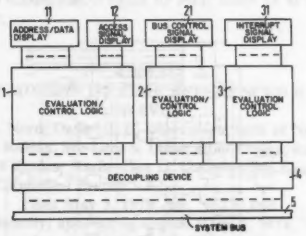
Hans Thinschmidt, Germering, and Eduard Scheiterer, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 19, 1980, Ser. No. 161,208

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1979, 2932749

Int. Cl.³ G01R *31/28;* G06F *11/00*

U.S. Cl. 371—29 14 Claims



1. A test facility for error diagnosis in multicomputer systems in which a plurality of computers are connected to a system bus, the test facility comprising;

an address/data information optical display device;

an access signal optical display device;

a bus control signal optical display device;

an interrupt signal optical display device;

a first evaluation/control logic device connected to said address/data information device and to said access signal display device;

a second evaluation/control logic device connected to said bus control signal device;

a third evaluation/control logic device connected to said interrupt signal display device;

a coupling/decoupling device for connection to the system bus and to said first, second and third evaluation/control logic devices and operable to selectively connect the evaluation/control logic devices to the system bus;

selection switching means operable to provide a first group of selection signals corresponding to selection address;

at least one comparator in each of said evaluation/control logic devices including first inputs connected to said selection switching means to receive said first group of selection signals and second inputs connected to receive address information signals from said system bus, said comparator responsive to equality of the selection signals and the address information signals to produce an output signal for switching through an access signal on the system bus;

said address/data information display device responsive to a switched-through access signal; and

said access signal display device and said interrupt signal display device each including first display means responsive to control signals to display the momentary states of all access and interrupt signals on the system bus and second display means responsive to the last-occurring signals on the system bus to display the most recently occurring access and interrupt information.

4,334,309

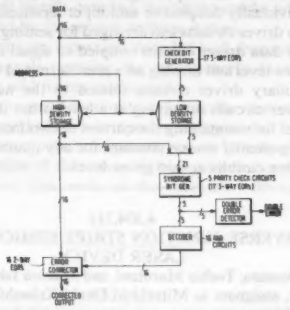
ERROR CORRECTING CODE SYSTEM

Robert D. Bannon, and Mahendra M. Bhansali, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,397

Int. Cl.³ G06F *11/10*

U.S. Cl. 371—38 12 Claims



1. An error correcting code mechanism comprising:

a high density storage unit receiving a data word;

means responsive to said data word for generating a set of check bits;

a low density storage unit receiving said check bits; and

error detecting and correcting means receiving a data word from said high density storage unit together with a corresponding set of check bits from said low density storage unit for determining if an erroneous bit exists only in said data word and reversing the state of said erroneous bit.

4,334,310

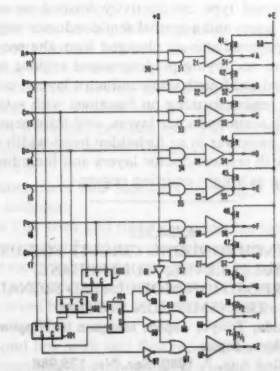
NOISE SUPPRESSING BILEVEL DATA SIGNAL DRIVER CIRCUIT ARRANGEMENT

Gerald A. Maley, Fishkill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 23, 1980, Ser. No. 162,344

Int. Cl.³ H02J *1/04*

U.S. Cl. 371—64 10 Claims



1. A noise suppressing bilevel data signal driver circuit arrangement comprising

a multiple of signal input lines,

a multiple of data driver circuits having input terminals individually coupled to said signal input lines and output

terminals at which data is delivered for utilization in subsequent circuitry,

a plurality of auxiliary driver circuits having input terminals and output terminals (at which auxiliary information is available),

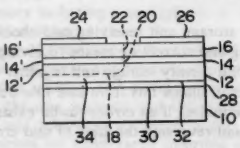
a common energizing potential source connected to all of said driver circuits, and

control circuitry having input terminals individually connected to said input signal lines and output terminals individually coupled to said input terminals of said auxiliary driver circuits and arranged for sensing the number of said data driver circuits coupled to signal input lines at a given level and turning on a predetermined number of said auxiliary driver circuits related to the number of data driver circuits remaining at a level other than said given level for maintaining the current drawn from said energizing potential source constant for any number of said data driver circuits at said given level.

4,334,311
TRANSVERSE JUNCTION STRIPE SEMICONDUCTOR LASER DEVICE

Etsuji Oomura; Toshio Murotani, and Makoto Ishii, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1980, Ser. No. 149,313
Int. Cl.³ H01S *3/19*
U.S. Cl. 372—47 19 Claims



1. In a semiconductor laser device, an improved structure comprising a semiconductor substrate, a first layer formed of a selected one of a semiconductive material of a first type conductivity and an electrically insulating material and disposed on said semiconductor substrate, a second semiconductor layer of a second type conductivity formed on said first layer, a third semiconductor layer of the second type conductivity formed on said second semiconductor layer, a fourth semiconductor layer of the second type conductivity formed on said third semiconductor layer, and a special semiconductor region having the first type conductivity changed from the second type conductivity and occupying predetermined regions of at least said second, third and fourth semiconductor layers, said special semiconductor region forming pn junctions with said second, third and fourth semiconductor layers, said third semiconductor layer being narrower in its forbidden band-width than said second and fourth semiconductor layers and including the pn junction serving as a light emitting region.

4,334,312
PHASE SYNCHRONIZING CIRCUIT FOR USE IN MULTI-LEVEL, MULTI-PHASE, SUPERPOSITION-MODULATED SIGNAL TRANSMISSION SYSTEM

Yasuharu Yoshida, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Aug. 7, 1980, Ser. No. 175,988
Claims priority, application Japan, Aug. 10, 1979, 54-101940; Feb. 12, 1980, 55-15684; Feb. 18, 1980, 55-18733
Int. Cl.³ H03D *13/00*
U.S. Cl. 375—20 11 Claims

1. A phase synchronizing circuit comprising:

voltage-controlled oscillator means responsive to a control signal for providing an output of varying oscillation frequency;

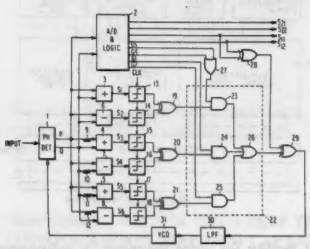
means for phase-detecting a multi-level, multi-phase superposition-modulated carrier wave with reference to the phase of the output of said voltage-controlled oscillator means the output of said phase-detecting means including at least first and second phase-orthogonal outputs;

means for demodulating the output of said phase detector means to provide a demodulated signal, the output of said demodulating means including at least one pair of mutually orthogonal demodulator outputs;

determining means responsive to said demodulated signal for providing output signals indicating the phase position of said modulated carrier wave with respect to the output phase of said voltage-controlled oscillator means;

a plurality of means for phase-shifting the output of said phase detector means by prescribed values the outputs of said phase-shifting means including at least one pair of mutually orthogonal phase-shifting means outputs;

a plurality of means for discriminating the outputs of said



plurality of phase shifter means with reference to a prescribed threshold level, the outputs of said discriminating means including at least one pair of mutually orthogonal discriminating means outputs;

a plurality of first frequency-multiplier means for frequency-multiplying each pair of mutually orthogonal outputs among the outputs of said plurality of discriminator means;

second frequency-multiplier means for frequency-multiplying each pair of mutually orthogonal outputs among the outputs of said demodulator means;

first gate means responsive to the output of said determining means for selectively passing therethrough one output among the outputs of said plurality of first frequency-multiplier means;

third frequency-multiplier means for frequency-multiplying the output of said first gate means and that of said second frequency-multiplier means; and

means for supplying said voltage-controlled oscillator means with the output of said third frequency-multiplier means as said control signal.

4,334,313
TIMING RECOVERY TECHNIQUE

Richard D. Gitlin, Monmouth Beach, and Howard C. Meadors, Jr., Ocean, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 8, 1980, Ser. No. 185,016
Int. Cl.³ H04B *3/04*
U.S. Cl. 375—106 24 Claims

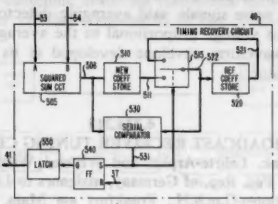
1. Apparatus comprising

means (20, 25, 35) for forming samples of a received signal which represents a succession of data symbols,

means (55, 60, 65, 251, 261, 271, 272) for forming a decision as to the value of each one of said symbols in response to the sum of the products of an ordered plurality of coefficients with respective ones of said samples and

means (60, 65, 70, 252, 262) for updating the values of said coefficients,

characterized by timing recovery means (40) for adjusting

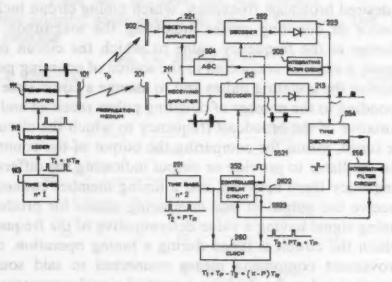


the phase of said sample forming means in such a way that a pair of coefficients in said ordered plurality are maintained substantially equal to each other in at least one aspect.

4,334,314
TRANSMISSION OF TIME REFERENCED RADIO WAVES

Georges P. Nard; Daniel J. E. Bourasseau, both of Nantes, and Jean M. Rabian, Ste-Luce S. Loire, all of France, assignors to Societe d'Etudes, Recherches et Construction Electroniques Sercel, Carquefou, France

Filed May 3, 1979, Ser. No. 37,068
Claims priority, application France, May 9, 1978, 78 13604
Int. Cl.[3] H04B *7/04;* G01S *5/06*
U.S. Cl. 375—111 22 Claims



1. A system for the radio-electrical transmission of a high-frequency signal carrying a timing-mark, comprising:

(a) transmitter circuit means for generating a first high-frequency electrical signal carrying a basic timing-mark which is predetermined and repetitive;

(b) a first antenna station coupled to said transmitter circuit means for transmitting waves corresponding to said first high-frequency electrical signal carrying said basic timing-mark;

(c) a second antenna station remote from said first antenna station, one of said first and second antenna stations having at least two spaced-apart antennae so as to define at least two different propagation paths for high-frequency waves between said first and second antenna stations, said second antenna station comprising means for receiving said transmitted waves carrying said basic timing-mark after travel thereof over said at least two different propagation paths, and for delivering corresponding high-frequency electrical signals which carry received timing-marks, said received timing-marks being the same as said basic timing-mark but being shifted in time with respect to said basic timing-mark in dependence upon the travelling time of the waves over each of said different propagation paths; and

(d) receiver circuit means coupled to said second antenna station for obtaining the received high-frequency electrical signals therefrom, said receiver circuit means comprising non-coherent combining means for

(1) separately decoding, for each of the different propagation paths, the corresponding received high-frequency electrical signals carrying the timing-marks which are delivered by the second antenna station,

(2) rectifying the separately decoded high-frequency electrical signals carrying the timing-marks in order to recover said timing-marks, and

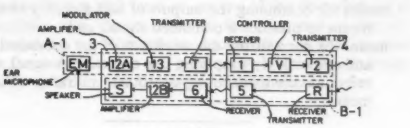
(3) non-coherently combining together the recovered said timing-marks into a composite timing-mark,

whereby said composite timing-mark is more closely related to the travelling time of the waves between said first and second antenna stations than each of the recovered timing-marks individually.

4,334,315
WIRELESS TRANSMITTING AND RECEIVING SYSTEMS INCLUDING EAR MICROPHONES

Hiroshi Ono, Tokyo, and Kazutoshi Mizoi, Mie, both of Japan, assignors to Gen Engineering, Ltd., Japan

Filed May 5, 1980, Ser. No. 146,675
Claims priority, application Japan, May 4, 1979, 54-55096
Int. Cl.[3] H04B *7/15, 1/38*
U.S. Cl. 455—11 10 Claims



1. A wireless transmitting and receiving system for use in two-way communication with a remote transmitter-receiver, comprising

an ear microphone for picking up bone-conducted voice signals through an external auditory canal wall of one ear of a wearer thereof;

a portable case having first mounting means for supporting said portable case adjacent the one ear of the wearer, and housing a first transmitter;

a wireless device having second mounting means for supporting said wireless device adjacent the wearer but spaced from said portable case and said ear microphone, and housing a second transmitter and first and second receivers;

said transmitters and receivers forming a communication loop including

a first link with said first transmitter for transmitting output signals of said ear microphone, said second receiver for receiving signals transmitted from said first transmitter and said second transmitter for transmitting signals received by said second receiver to the remote transmitter-receiver; and

a second link with said first receiver for receiving signals transmitted from the remote transmitter-receiver;

whereby said first and second links provide a wireless connection between said portable case and said wireless device and permit wireless communication signals to be transmitted and received between the one ear of the wearer in which said ear microphone is mounted and the remote transmitter-receiver.

4,334,316

PRE-DETECTION MAXIMAL RATIO COMBINING SYSTEM FOR DIVERSITY RECEPTION OF RADIO FREQUENCY SIGNALS

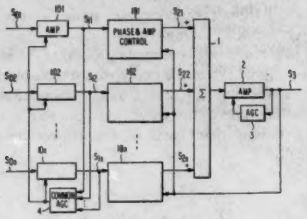
Motomichi Tanaka, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1980, Ser. No. 201,642

Claims priority, application Japan, Oct. 31, 1979, 54-140557

Int. Cl.³ H04B 1/10

U.S. Cl. 455—139 3 Claims



1. A system for pre-detection maximal ratio combining of a plurality of received diversity signals, comprising:

a plurality of control means for controlling the phase and amplitude of each of a plurality of pre-detection signals, each of said control means including means to derive, from a respective pre-detection diversity signal, a set of mutually orthogonal components, means to correlate each component with a reference comparison signal and means to provide a control means output signal in response to the output of said correlation means.

means for combining the outputs of said plurality of control means to produce a combined signal; and

means for normalizing the amplitude of the combined signal and respectively supplying this normalized signal, as said reference comparison signal, to said plurality of control means.

4,334,317

NOISE BLANKING CIRCUITRY IN A RADIO RECEIVER

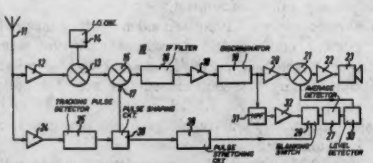
Graham E. Beesley, Basingstoke, England, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 13, 1980, Ser. No. 129,927

Claims priority, application United Kingdom, Apr. 30, 1979, 7914881

Int. Cl.³ H04B 1/10

U.S. Cl. 455—194 9 Claims



1. A radio receiver including means for receiving radio frequency signals, tuner means for processing the received radio signals and producing audio output signals in response thereto, a blanker circuit for detecting noise pulses in the received radio frequency signals and producing blanking pulses for blanking the tuner means in response thereto, an FM squelch circuit responsive to said audio output signals and to noise signals above a predetermined frequency to generate squelch signals when the noise signals exceed a predetermined amplitude to mute said audio signals, and said squelch circuit including a detector responsive to blanking pulses from said FM blanker circuit for eliminating squelch false muting of the receiver by the FM squelch circuit in response to blanking pulse spikes from the blanker circuit and thereby reducing the susceptibility of false squelching said tuner means further includes a discrimination and an averaging detector responsive to noise signals and responsive also to noise blanking signals produced in response to the receipt of radio frequency signals including noise signals, said averaging detector providing a DC output voltage proportional to the average level of the voltage waveform envelope developed at its input by the discriminator.

4,334,318

BROADCAST RECEIVER TUNING CIRCUIT

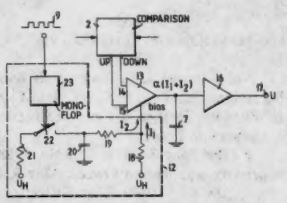
Otto Klank, Lehrte-Arpke, and Wilfried Wühling, Hanover, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 26, 1980, Ser. No. 133,988

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1979, 2912710

Int. Cl.³ H04B 1/16

U.S. Cl. 455—195 5 Claims



1. In a tuning circuit for tuning an oscillator of a receiver to a desired broadcast frequency, which tuning circuit includes a source of counting pulses indicating the magnitude of the change in the frequency value to which the circuit is to be tuned, a counter connected to the source of counting pulses to receive the counting pulses and to assume a count state corresponding to the number of counting pulses received and representative of the broadcast frequency to which the circuit is to be tuned, means for comparing the output of the counter and the oscillator to provide an output indicating the difference in frequency there between, and a timing member connected to receive the output of said comparing means for producing a tuning signal having a value determinative of the frequency to which the circuit is tuned during a tuning operation, the improvement comprising means connected to said source of counting pulses for deriving a control signal representative of the frequency of said pulses, and means connecting said control signal deriving means to said timing member for varying said tuning signal in accordance with said control signal in such a manner that as the frequency of said counting pulses increases, the rate of change of the frequency to which said circuit is tuned is increased.

4,334,319

BATTERY-POWERED RECEIVERS

George W. Gurry, 3 Highfield Close, Danbury, Essex, England

Filed Oct. 26, 1979, Ser. No. 89,261

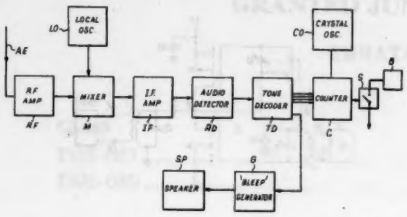
Claims priority, application United Kingdom, Oct. 27, 1978, 42201/78

Int. Cl.³ H04B 1/06

U.S. Cl. 455—227 3 Claims

1. A battery-powered receiver comprising a tone decoder which is adapted to sense an incoming electromagnetic signal comprising a predetermined coded address signal followed by a coded command signal, the address signal comprising at least two tone signals which are transmitted sequentially and each of which comprises an electromagnetic signal having a frequency different from the frequency of the or each adjacent tone signal

and the command signal comprising a tone signal which is an electromagnetic signal which can assume any one of at least two different predetermined frequencies, the tone decoder being adapted, upon sensing the incoming signal, to generate an output signal representative of the coded command signal, timing means, switching means for connection between a battery and other circuits components in the receiver, means



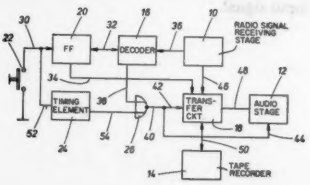
coupling the switching means to an output of the timing means, and means for applying the output signal from the decoder to the timing means, whereby the timing means generate an output which is applied to the switching means and causes the switching means to operate to disconnect the battery from at least one of the said circuit components for a predetermined interval of time represented by the coded command signal.

4,334,320

TRAFFIC INFORMATION RADIO SIGNAL RECEIVER

Helmut Liman, Nordstemmen, Fed. Rep. of Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Nov. 25, 1980, Ser. No. 210,323
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1979, 2950284
Int. Cl.³ H04B *1/16*
U.S. Cl. 455—227 **6 Claims**



1. In a radio receiver having a radio signal receiving stage **(10)** providing program signals and traffic information signals, an audio stage providing audio output signals,

a traffic information decoder **(16)** responsive to predetermined signals received by said receiving stage and then providing a corresponding traffic information control signal;

a transfer circuit **(18)** connected to the radio receiving stage **(10)** and the audio stage to transfer signals from the receiving stage to the audio stage, and being connected to and controlled by the traffic information control signal to, selectively, inhibit transfer of program signals and instead transfer traffic information signals to the audio stage;

and a control switch **(20, 22)** controlling, respectively, response of the decoder **(16)** and hence selective transfer of program signals and/or information signals to the audio stage,

an information signal reproduction level simulation circuit to simulate traffic information signals for reproduction by the audio stage in the absence of said predetermined signals to which the decoder **(16)** responds, comprising

a timing element **(24)** connected to and controlled by said control switch and upon operation thereof for at least a predetermined time interval providing an output;

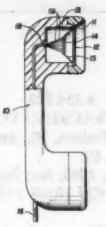
and connection means **(54, 26)** controlled by said timing element output after elapse of the predetermined interval to apply a traffic information simulating signal to said transfer circuit **(16)** for subsequent reproduction by the audio stage.

4,334,321

OPTO-ACOUSTIC TRANSDUCER AND TELEPHONE RECEIVER

Seymour Edelman, 9115 Glenridge Rd., Silver Spring, Md. 20910

Filed Jan. 19, 1981, Ser. No. 226,447
Int. Cl.³ H04B *9/00*
U.S. Cl. 455—614 **14 Claims**



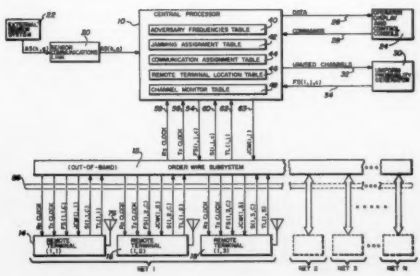
1. A transducer element for use in a telephone receiver or the like including sound producing means and comprising at least an optical fiber element adapted to transmit and absorb modulated light and having its light transmissivity gradually decreasing from a high level at one end of the fiber element to substantially zero transmissivity at the other end of the element, whereby modulated light absorbed by the fiber element causes thermal expansion and contraction of the element longitudinally for driving said sound producing means.

4,334,322

COMMUNICATION MANAGEMENT SYSTEM FOR PROVIDING ANTIJAM/PRIVACY CAPABILITIES FOR VOICE RADIO COMMUNICATIONS

Egbert B. Clark, III, Alexandria, Va., assignor to E-Systems, Inc., Dallas, Tex.

Filed Oct. 26, 1979, Ser. No. 88,523
Int. Cl.³ H04B *17/00, 3/46*
U.S. Cl. 455—62 **27 Claims**



1. Communication management apparatus for selecting radio frequency channels for use by a plurality of remote communication terminals, comprising in combination:

(a) a central processor for generating radio frequency channel assignment command for said communication terminals,

(b) an order wire communication system connected to receive said channel assignment commands from said central processor and transfer said channel assignment command through a communication channel independent of the radio frequency channels used by the communication terminals, and

(c) an interface module for each remote communication terminal, said module adapted to receive said channel assignment commands from said order wire communication system and generate control signals to tune at least one of said communication terminals to operate on the radio frequency channel designated by said channel assignment command.

4,334,323

SELF TRACKING TUNER

Frederic J. Moore, Des Plaines, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Sep. 8, 1980, Ser. No. 184,719

Int. Cl.³ H04B 1/16

U.S. Cl. 455—179 **24 Claims**

1. In a tuner circuit of the type having a tunable oscillator and tunable circuit means including a tunable circuit receiving at an input thereof a signal from an antenna or other signal input apparatus, the tunable circuits cooperating with the tunable oscillator to provide an intermediate frequency signal at an output of the tuner circuit, the tuner circuit having means associated therewith for a user to select a target frequency at which the tuner is to be tuned, the improvement comprising:

tuning means cooperatively coupled to the tunable circuit means and responsive to the target frequency selection means for individually, automatically, and successively tuning each tunable circuit to the selected target frequency.

4,334,324

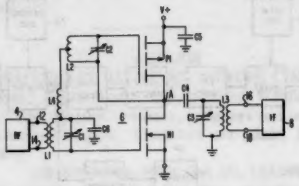
COMPLEMENTARY SYMMETRY FET FREQUENCY CONVERTER CIRCUITS

Merle V. Hoover, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 31, 1980, Ser. No. 202,668

Int. Cl.³ H04B 1/28

U.S. Cl. 455—333 **12 Claims**



1. A frequency converter comprising:

first and second power supply terminals for receiving an operating potential therebetween;

first and second FET transistors of opposite conductivity type, each having respective source, gate and drain electrodes, the respective drain electrodes thereof being coupled to a circuit node;

means for coupling the source electrode of said first FET transistor to said first power supply terminal;

means for coupling the source electrode of said second FET transistor to said second power supply terminal;

feedback means connected between the gate electrode of said first FET transistor and one of said source and drain electrodes of said first FET transistor for conditioning that transistor to oscillate so as to provide an oscillator signal at said circuit node;

input means for coupling an input signal to the gate electrode of said second FET transistor; and

tuning means coupled to said circuit node for selecting signal components corresponding to a beat frequency between the frequency of said oscillator signal and the frequency of said input signal.

DESIGN PATENTS

GRANTED JUN. 8, 1982

ERRATA

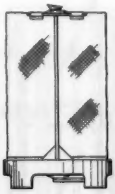
For CLASS	See PATENT NO.
D25-087	264,886
D06-080	264,889

264,765
WOMEN'S JEAN
Ruth A. Hattori, 531 Josephine, Denver, Colo. 80206
Filed Apr. 7, 1980, Ser. No. 137,796
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—28

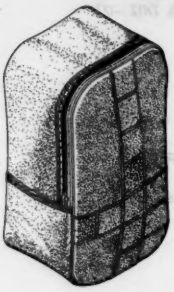
264,766
QUICK-RELEASE CONNECTOR
Philip K. Huff, 2600 H Walnut Ave., Tustin, Calif. 92680
Filed May 19, 1980, Ser. No. 150,970
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—408

264,767
FASTENER BUCKLE
Pierre Spreter, Geneva, Switzerland, assignor to Christian Dior, S.A., Paris, France
Filed Oct. 18, 1978, Ser. No. 952,579
Claims priority, application France, Aug. 18, 1978, 76808
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—427

264,768
COMBINED SHIPPING AND STORAGE CONTAINER OR SIMILAR ARTICLE
Jan Öjve, Stockholm, Sweden, assignor to Revent Food Machinery AB, Stockholm, Sweden
Filed Mar. 25, 1980, Ser. No. 133,907
Claims priority, application Sweden, Sep. 26, 1979, 2115/79
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D3—30.1

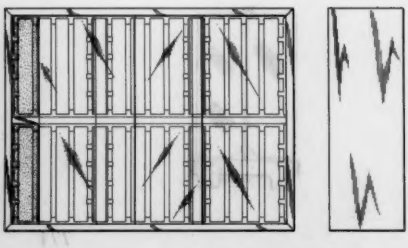


264,769
CAMERA BAG
George Koszegi, South Bend, Ind., assignor to Koszegi Leather & Vinyl Products, Inc., South Bend, Ind.
Filed Jan. 5, 1979, Ser. No. 1,378
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—33



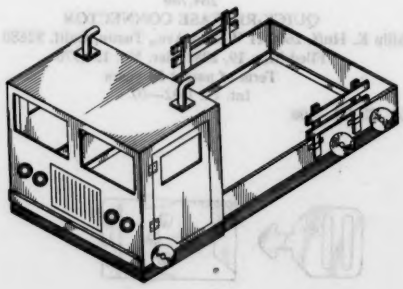
264,770
VIDEO CASSETTE STORAGE CONTAINER
Jerry M. Long, 382 Riverside Ave., Ben Lomond, Calif. 95005
Filed Oct. 2, 1978, Ser. No. 947,421
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—35

264,771
VIDEO-TAPE CASE WITH REMOVABLE PARTITIONS
Joseph L. Berkman, 48 Country Rd., Mamaroneck, N.Y. 10543
Filed Aug. 29, 1979, Ser. No. 70,789
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—35



264,772
FISHING REEL POUCH
James C. Motsko, Box 737, 400 N. 6th St., Ocean City, Md. 21842
Filed Sep. 11, 1979, Ser. No. 74,552
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—38

264,773
BED
Paul H. Sutherland, 105 Green Leaf Dr., Latham, N.Y. 12110
Filed Aug. 31, 1979, Ser. No. 71,090
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—5

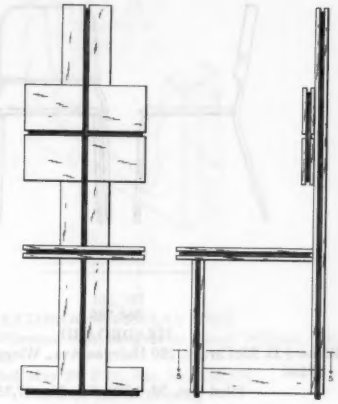


264,774
TRACTOR SEAT OR SIMILAR ARTICLE
James R. McGirk, Medinah, and Robert A. Skyer, Palatine, both of Ill., assignors to International Harvester Company, Chicago, Ill.
Filed Oct. 19, 1979, Ser. No. 86,503
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—48

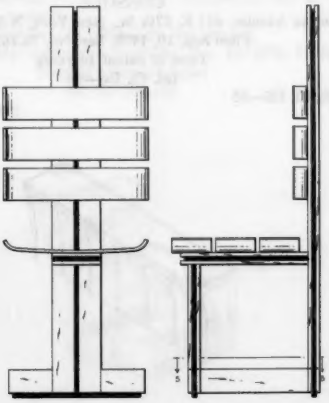
264,775
CHAIR
Henry Olko, Chicken Valley Rd., Locust Valley, N.Y. 11560
Filed Jan. 16, 1980, Ser. No. 112,634
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—57

264,776
SEAT
Alan H. Friedman, Millburn, N.J., assignor to The Bean Station Furniture Factory, Bean Station, Tenn.
Filed May 5, 1980, Ser. No. 146,524
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

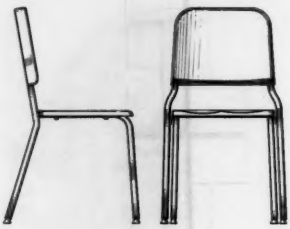
264,777
CHAIR
Steven D. Gageby, 2025 N. Bradley St., St. Paul, Minn. 55117
Filed Jul. 17, 1979, Ser. No. 58,912
The portion of the term of this patent subsequent to May 4, 1996, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—78



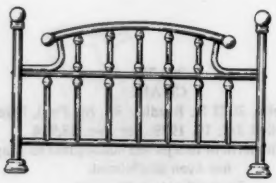
264,778
CHAIR
Steven D. Gageby, 2025 N. Bradley St., St. Paul, Minn. 55117
Filed Jul. 19, 1979, Ser. No. 58,914
The portion of the term of this patent subsequent to May 4, 1996, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—78



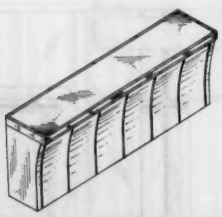
264,779
CHAIR
Jerry A. Wenger, Owatonna; Darrel E. Newell, Lakeville; Harvey M. Urch, West Concord, and Logan W. Johnson, Edina, all of Minn., assignors to Wenger Corporation, Owatonna, Minn.
Continuation-in-part of Ser. No. 877,357, Feb. 13, 1978. This application Jul. 30, 1979, Ser. No. 61,927
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—78



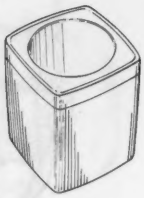
264,780
HEADBOARD
Richard D. McCarthy, 280 Halcyon Ave., Winston-Salem, N.C. 27104
Filed Oct. 23, 1979, Ser. No. 87,534
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—82



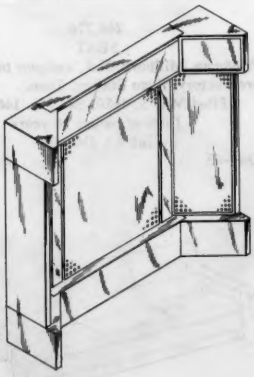
264,781
CONSOLE
Ernesto Azzalin, 411 E. 57th St., New York, N.Y. 10022
Filed Sep. 10, 1979, Ser. No. 74,161
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—85



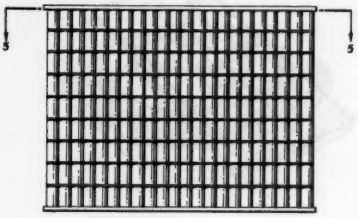
264,782
TOILET BRUSH STAND
Bruce R. Thompson, Tranmere, Australia, assignor to UPL Group Limited, Brisbane, Australia
Filed Feb. 13, 1980, Ser. No. 121,213
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—86

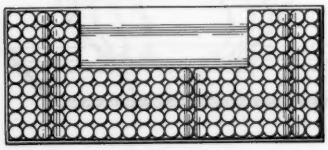


264,783
MERCHANDISE DISPLAY UNIT
Michael Wahl, Roslyn, N.Y., assignor to Marlboro Marketing, Inc., New York, N.Y.
Filed Jan. 14, 1980, Ser. No. 112,094
Term of patent 14 years
Int. Cl. D06—*99*
U.S. Cl. D6—139

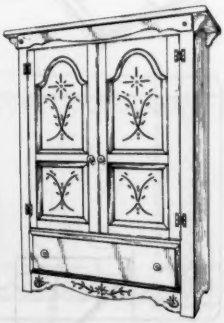


264,784
BAR
Juan N. Johnson, 2027 E. 17th St., NE., Winston-Salem, N.C. 27105
Filed Mar. 26, 1980, Ser. No. 134,169
Term of patent 14 years
Int. Cl. D06—*03*
U.S. Cl. D6—144

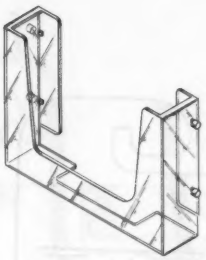




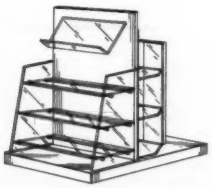
264,785
ARMOIRE
Melbourne F. Smith, Jr., Hickory, N.C., assignor to Broyhill Furniture Industries, Inc., Lenoir, N.C.
Filed Sep. 22, 1978, Ser. No. 945,139
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—154



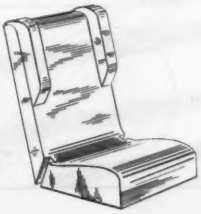
264,786
LITERATURE HOLDER
Chuck Faas, and Zeb Billings, both of Elm Grove, Wis., assignors to Sight & Sound International, Inc., New Berlin, Wis.
Filed Jan. 8, 1980, Ser. No. 110,504
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—184



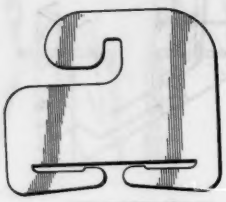
264,787
BATHROOM DISPLAY UNIT
Nedim Savas, Wheaton, Md., assignor to Russel William, Ltd., Columbia, Md.
Filed May 29, 1980, Ser. No. 154,475
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—186



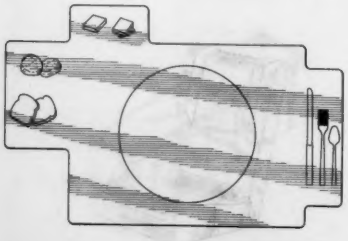
264,788
AUXILIARY SEAT FOR A CHILD
Gaynor J. Blanchard, 2 Chilton Parade, Turramurra, New South Wales 2074, Australia
Filed Dec. 11, 1978, Ser. No. 968,143
Claims priority, application Australia, Jun. 14, 1978, 75053
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—201



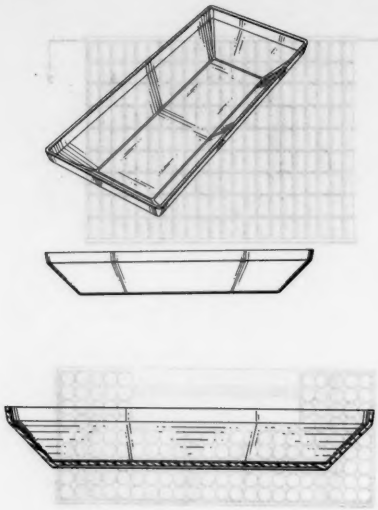
264,789
ARTICLE HANGER
John F. Zyla, 1910 Kingridge Ct., Walnut Creek, and John J. Nemec, 52 Riverton Dr., San Francisco, both of Calif. 94596
Filed Mar. 21, 1980, Ser. No. 133,487
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—254



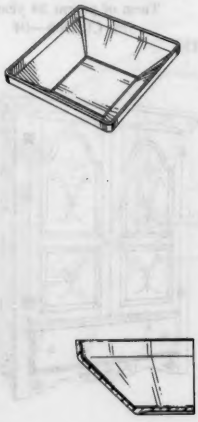
264,790
PLACE MAT
Medhat M. Kamel, Alexandria, and Mortimer R. Dock, Arlington, both of Va., assignors to T-Star Research, Inc., Alexandria, Va.
Filed Sep. 13, 1979, Ser. No. 75,506
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D6—271



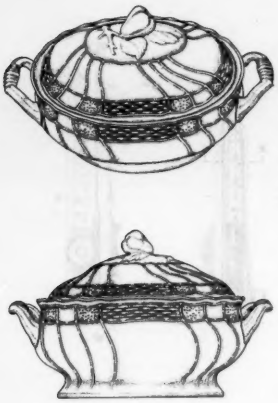
264,791
COMBINED FOOD STORAGE AND SERVICE DISH
Rino Conti, Stoughton, Mass., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Feb. 12, 1979, Ser. No. 11,247
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—1



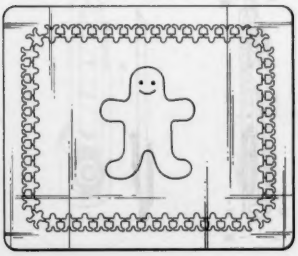
264,792
COMBINED FOOD STORAGE AND SERVICE DISH
Rino Conti, Stoughton, Mass., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Feb. 12, 1979, Ser. No. 11,248
The portion of the term of this patent subsequent to Jun. 8, 1996, has been disclaimed.
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—1



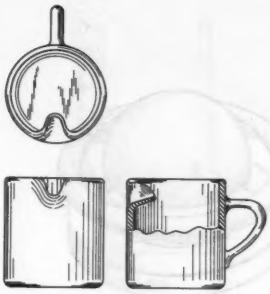
264,793
TUREEN
Alfred Blake, Hillsdale, N.J., assignor to American Commercial Inc., Secaucus, N.J.
Filed May 30, 1980, Ser. No. 154,779
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—18



264,794
PASTRY SHEET OR THE LIKE
Ann K. Fritz, Auburndale, Mass., and Peggy J. Bridges, Orlando, Fla., assignors to Dart Industries Inc., Northbrook, Ill.
Filed Jun. 24, 1980, Ser. No. 162,452
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—41

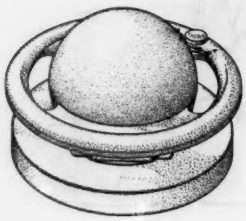


264,795
AMUSEMENT PITCHER
Edward M. Strieber, 5400 Highland Crest Dr., Austin, Tex. 78731
Filed Jul. 9, 1979, Ser. No. 55,620
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—64



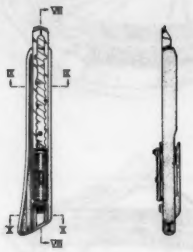
264,796
WRENCH
Steven E. Frick, Box 2011, Houston, Tex. 77001, and Douglas R. Merritt, C-2 Lawrence Apts., West Dr., Princeton, N.J. 08540
Filed Mar. 31, 1980, Ser. No. 136,107
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—17

264,797
AUTOMOBILE CLEANING AND WAXING TOOL
Robert E. Burglin, 517 S. Archer, Anaheim, Calif. 92804, and Sam S. Itaya, 420 Lakeview Rd., Pasadena, Calif. 91105
Continuation of Ser. No. 785,191, Apr. 6, 1977, abandoned. This application Feb. 2, 1979, Ser. No. 8,890
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—62

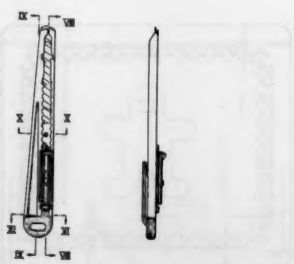


264,798
WOOD SPLITTING IMPLEMENT HEAD
Dale A. Jones, Rte. 1, Palmetto, Ga. 30268
Division of Ser. No. 857,797, Dec. 5, 1977, Pat. No. Des 257,826. This application Apr. 4, 1980, Ser. No. 137,125
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—78

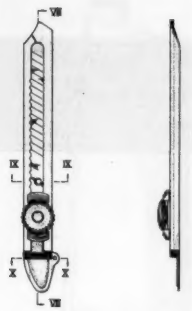
264,799
CUTTER KNIFE
Hiroshi Osada, Seki, Japan, assignor to Kai-Cutlery Center Co., Ltd., Gifu, Japan
Filed Feb. 11, 1980, Ser. No. 120,285
Claims priority, application Japan, Nov. 16, 1979, 54-48156
Term of patent 7 years
Int. Cl. D8—*03*
U.S. Cl. D8—99



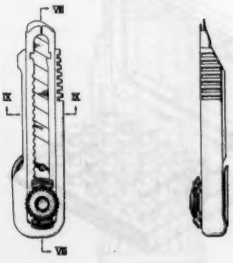
264,800
CUTTER KNIFE
Hiroshi Osada, Seki, Japan, assignor to Kai-Cutlery Center Co., Ltd., Gifu, Japan
Filed Feb. 13, 1980, Ser. No. 121,283
Claims priority, application Japan, Nov. 14, 1979, 54-47604
Term of patent 7 years
Int. Cl. D8—*03*
U.S. Cl. D8—99



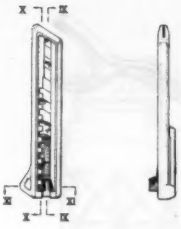
264,801
CUTTER KNIFE
Hiroshi Osada, Seki, Japan, assignor to Kai Cutlery Center Co., Ltd., Gifu, Japan
Filed Feb. 22, 1980, Ser. No. 123,732
Claims priority, application Japan, Nov. 16, 1979, 54-48154
Term of patent 7 years
Int. Cl. D8—*03*
U.S. Cl. D8—99



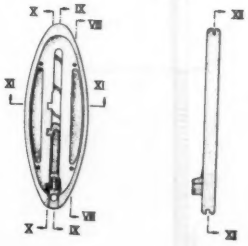
264,802
CUTTER KNIFE
Hiroshi Osada, Seki, Japan, assignor to Kai Cutlery Center Co., Ltd., Gifu, Japan
Filed Feb. 22, 1980, Ser. No. 123,733
Term of patent 7 years
Int. Cl. D8—*03*
U.S. Cl. D8—99



264,803
CUTTER KNIFE
Naoyoshi Machida, Seki, Japan, assignor to Kai Cutlery Center Co., Ltd., Gifu, Japan
Filed Mar. 7, 1980, Ser. No. 127,966
Claims priority, application Japan, Oct. 22, 1979, 54-44361
Term of patent 7 years
Int. Cl. D8—*03*
U.S. Cl. D8—99



264,804
CUTTER KNIFE
Naoyoshi Machida, Seki, Japan, assignor to Kai Cutlery Center Co., Ltd., Gifu, Japan
Filed Mar. 7, 1980, Ser. No. 127,967
Claims priority, application Japan, Oct. 25, 1979, 54-44926
Term of patent 7 years
Int. Cl. D8—*03*
U.S. Cl. D8—99



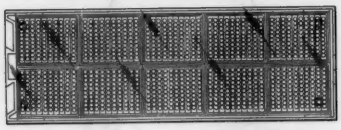
264,805
GRIPPING AND HOLDING DEVICE
George Annand, 332 Mastin Pl., Ridgewood, N.J. 07450
Filed Oct. 25, 1978, Ser. No. 954,401
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—107

264,806
WINDER
Walter L. Russell, 9122 Birch La., Wichita, Kans. 67212
Filed Oct. 18, 1979, Ser. No. 85,904
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—358

264,807
SCREW
Albert Baumgartner, Kriessern, Switzerland, assignor to SFS Stadler AG, Heerbrugg, Switzerland
Filed Sep. 19, 1979, Ser. No. 77,162
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—387

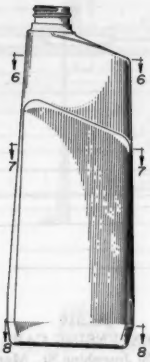
264,808
SCREW HOLDING CLIP FOR SCREW DRIVERS
Oscar B. Burgeson, Bristol, and Richard W. Phelps, Deep River, both of Conn., assignors to The Stanley Works, New Britain, Conn.
Filed Mar. 7, 1980, Ser. No. 128,045
Term of patent 14 years
Int. Cl. D8—*08, 04*
U.S. Cl. D8—395

264,809
PACKAGE OF SEWING MACHINE NEEDLES
Masumi Takeuchi, Ueda, Japan, assignor to Organ Needle Col, Ltd., Japan
Filed Aug. 6, 1979, Ser. No. 63,984
Claims priority, application Japan, Feb. 7, 1979, 54-4198; Apr. 20, 1979, 54-16252
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—303



264,810
PLURAL MEDICINE VIAL SUPPORTING TRAY AND COVER
John D. Voltmann, 155 Aldren Ave., Jamestown, N.Y. 14701
Filed Jun. 22, 1979, Ser. No. 51,192
Term of patent 14 years
Int. Cl. D9—*03;* D24—*99*
U.S. Cl. D9—341

264,811
BOTTLE
Richard L. Weckman, Perrysburg, Ohio, assignor to The Clorox Company, Oakland, Calif.
Filed Oct. 29, 1979, Ser. No. 88,945
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—375

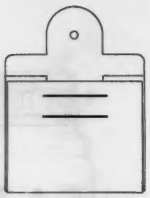


264,812
JAR OR SIMILAR ARTICLE
David M. O'Toole, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed May 23, 1980, Ser. No. 152,703
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—385

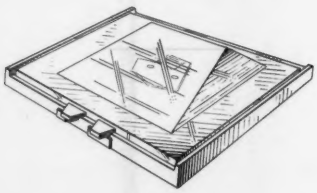
264,813
JAR OR SIMILAR ARTICLE
Jerald E. Potter, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Jun. 12, 1980, Ser. No. 158,885
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—385

264,814
BOTTLE
Pierre Dinand, Levallios, France, assignor to Yardley of London, Inc., Chicago, Ill.
Filed Jul. 10, 1980, Ser. No. 168,384
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—389

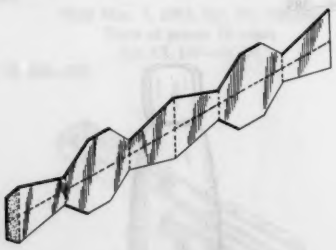
264,815
COMBINED DISPLAY HANGER AND MAILING PACKAGE OR SIMILAR ARTICLE
John H. Lincoln, 1510 Mission Canyon Rd., Santa Barbara, Calif. 93105
Filed Mar. 31, 1980, Ser. No. 135,645
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—415



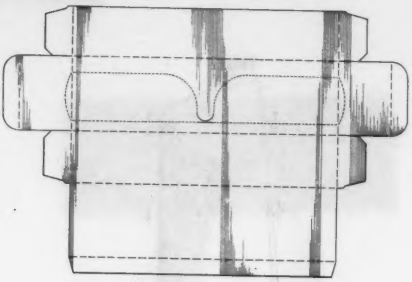
264,816
PHONOGRAPH CARTRIDGE BOX
Sanford Drelinger, White Plains; Norman H. Dieter, Jr., Pleasantville, and Lazzaro Padron, Irvington, all of N.Y., assignors to Micro-Acoustics Corporation, Elmsford, N.Y.
Filed Apr. 16, 1980, Ser. No. 140,741
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—424



264,817
SLEEVE BLANK FOR CONNECTING CONTAINERS
John J. Austin, LaGrange, Ill., assignor to Champion International Corporation, Stamford, Conn.
Filed Jan. 22, 1980, Ser. No. 114,191
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—433

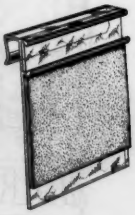


264,818
CARTON BLANK
Floyd F. Fallen, and Calvin L. Wilson, both of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.
Filed Nov. 16, 1979, Ser. No. 95,526
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—433

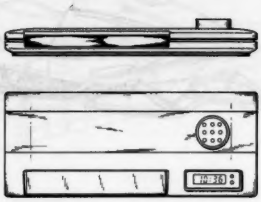


264,819
DISPENSING CAP
George E. Burnett, 1020 Josephine St., Mareinette, Wis. 54143
Filed Jun. 30, 1978, Ser. No. 921,130
Term of patent 14 years
Int. Cl. D09—*07*
U.S. Cl. D9—449

264,820
JEWELRY DISPLAY CARD
Jeffrey A. Feibelman, Cranston, R.I., assignor to A & H Mfg. Co., Johnston, R.I.
Filed Feb. 12, 1980, Ser. No. 120,935
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—457

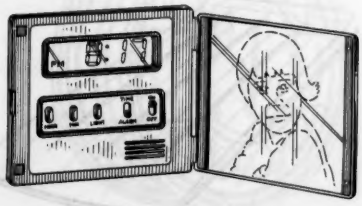


264,821
COMBINED CLOCK AND DESK HOLDER FOR NOTE PAPER AND WRITING INSTRUMENTS
Walter Henkels, Holunderweg 1, 5142 Hückelhoven, Fed. Rep. of Germany
Filed Jul. 2, 1980, Ser. No. 165,405
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1980, MR 130
Term of patent 14 years
Int. Cl. D10—*01*; D19—*02*
U.S. Cl. D10—2



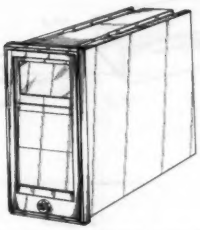
264,822
CLOCK
Guy L. Dunlap, 2328 W. 12th St., Santa Ana, Calif. 92703
Filed Nov. 5, 1979, Ser. No. 91,515
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—10

264,823
TRAVELER'S ALARM CLOCK COMPACT
Takeshi Satoh, Kawasaki, Japan, assignor to Howard Miller Clock Company, Zeeland, Mich.
Filed Jun. 2, 1980, Ser. No. 155,170
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15

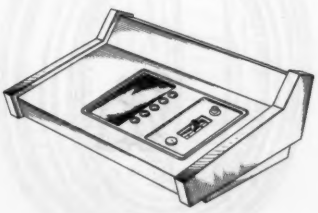


264,824
COMBINED SURGICAL RULER AND MARKING PEN
Dan Sandel, 19524 Halsted, Northridge, Calif. 91324
Filed Nov. 30, 1979, Ser. No. 99,083
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—71

264,825
WATTMETER
Kenzou Izaki, Chiba, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Apr. 29, 1980, Ser. No. 144,843
Claims priority, application Japan, Nov. 9, 1979, 54-46778
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—75

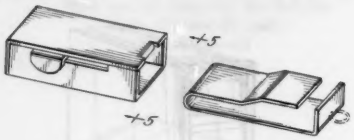


264,826
SECURITY SYSTEM CONSOLE
Frederick J. Conforti, Aurora; Philip J. Burnstein, Skokie, and Kenneth R. Fenne, Glen Ellyn, all of Ill., assignors to Pittway Corporation, Aurora, Ill.
Filed Jan. 10, 1980, Ser. No. 111,169
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



264,827
RING GUARD
Louise B. Cunningham, 1515 N. 22nd St., Corsicana, Tex. 75110
Filed May 7, 1979, Ser. No. 36,459
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—34

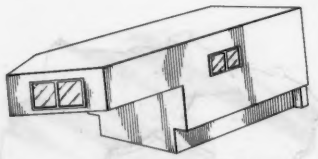
264,828
JEWELRY CLASP
Ernest F. Gray, 3246 San Amadeo, Apt. O, Laguna Hills, Calif. 92653
Filed Nov. 30, 1979, Ser. No. 98,740
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—87



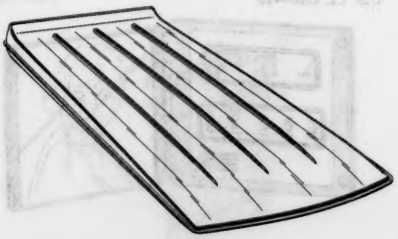
264,829
FANCIFUL FIGURINE OF A BOXER PUP
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Co., Inc., Laguna Hills, Calif.
Filed Dec. 17, 1979, Ser. No. 104,693
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

264,830
SNOWMOBILE
Atsushi Ishiyama, Tokyo, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan
Filed Sep. 10, 1979, Ser. No. 73,620
Claims priority, application Japan, Mar. 14, 1979, 54-10051
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—7

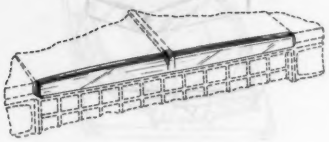
264,831
CAMPER UNIT FOR A PICK-UP TRUCK
Eugene Dulisse, 107 Grand Blvd., Sault Ste. Marie, Ontario, Canada (P6B 4S1)
Filed Aug. 2, 1979, Ser. No. 63,260
Claims priority, application Canada, Feb. 2, 1979, 02-02-79-1
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156



264,832
CONTAINER, ESPECIALLY FOR TRANSPORTING SKIS ON THE ROOF OF A CAR
Kaj Lind, Margaretagatan 5, and Lars-Olof Gustafsson, Akaregatan 38, both of S-331 00 Varnamo, Sweden
Filed Dec. 7, 1978, Ser. No. 967,437
Claims priority, application Sweden, Jun. 8, 1978, 78-1463
Term of patent 3½ years
Int. Cl. D12—*16*
U.S. Cl. D12—157

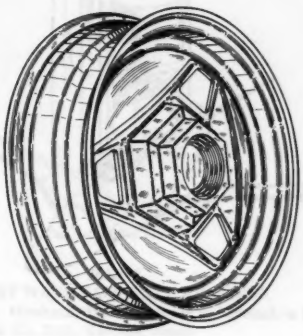


264,833
TRIM PIECE FOR AN AUTOMOBILE HOOD
Ulric W. Trombley, R.R. #1, Chisago City, Minn. 55013, and Richard J. Nozel, 354 Edith Dr., West St. Paul, Minn. 55118
Filed Mar. 20, 1980, Ser. No. 132,113
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—190



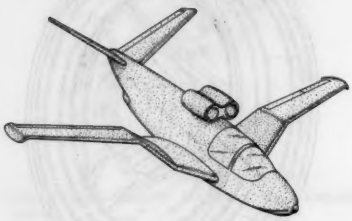
264,834
VEHICLE WHEEL
John A. Main, Plymouth, Mich., assignor to Kelsey-Hayes Co., Romulus, Mich.
Filed Jan. 14, 1980, Ser. No. 111,576
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—210

264,835
VEHICLE WHEEL
Donald J. Reid, Pleasant Ridge, Mich., assignor to Kelsey-Hayes Co., Romulus, Mich.
Filed Jan. 25, 1980, Ser. No. 115,476
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211

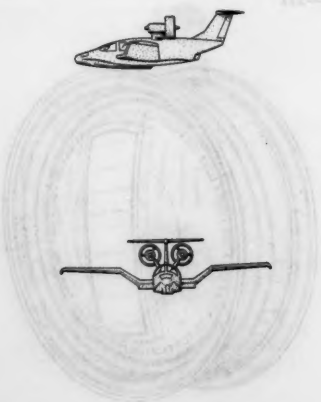


264,836
VEHICLE WHEEL
John A. Main, Plymouth, and Lawrence K. Shinoda, West Bloomfield, both of Mich., assignors to Kelsey-Hayes Co., Romulus, Mich.
Filed Feb. 1, 1980, Ser. No. 117,730
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211

264,837
AIRCRAFT
Peter Dornier, Schachenerstrasse 97, Lindau, Fed. Rep. of Germany (8990)
Filed Nov. 7, 1977, Ser. No. 849,485
The portion of the term of this patent subsequent to Jun. 10, 1994, has been disclaimed.
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—324



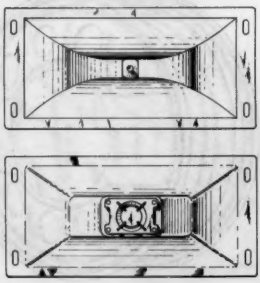
264,838
AIRCRAFT
Peter Dornier, Schachenerstrasse 97, Lindau, Fed. Rep. of Germany (8990)
Filed Sep. 5, 1979, Ser. No. 72,688
Claims priority, application Fed. Rep. of Germany, The portion of the term of this patent subsequent to Jun. 10, 1994, has been disclaimed.
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—324



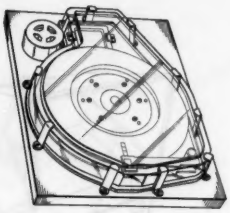
264,839
HOUSING FOR ELECTRONIC APPARATUS
Charles A. Ross, and Jerry L. Schell, both of c/o Keas Electronics, 210 W. Main St., Chanute, Kans. 66720
Filed Sep. 22, 1978, Ser. No. 944,872
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—41

264,840
LOUD SPEAKER CABINET
Fred Feldman, 638 Coffeen St., Watertown, N.Y. 13601
Filed Jun. 3, 1980, Ser. No. 156,172
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—31

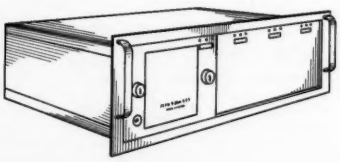
264,841
SPEAKER HORN
Charles Pickrel, Seattle, Wash., assignor to Speakerlab, Inc., Seattle, Wash.
Filed Dec. 13, 1979, Ser. No. 103,338
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—35



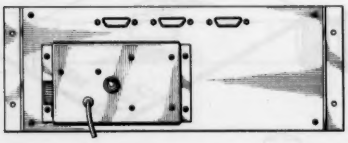
264,842
FIXED DISK DRIVE
Donald V. Daniels, Santa Cruz; Terence H. West, San Jose, and Albert S. Chou, Monte Sorreno, all of Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Dec. 4, 1978, Ser. No. 966,178
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—109



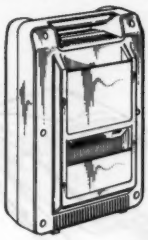
264,843
MULTIPLE MODULE SERIAL LINK ENCRYPTION UNIT OR SIMILAR ARTICLE
Joseph W. Karas; Robert F. Pfeifer, both of Phoenix, and Robert Samson, Scottsdale, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.
Filed Apr. 2, 1979, Ser. No. 25,955
Term of patent 14 years
Int. Cl. D14—*02;* D13—*03*
U.S. Cl. D14—100



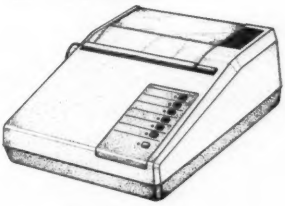
264,844
ELECTRONIC SYSTEM HOUSING FOR PRINTED CIRCUIT BOARDS AND POWER SOURCE
Winfree P. Tuck, Huntsville, Ala., assignor to Inteo Incorporated, Fairfax, Va.
Filed Jun. 28, 1979, Ser. No. 52,709
Term of patent 14 years
Int. Cl. D14—*3*
U.S. Cl. D14—100



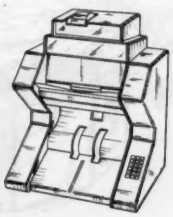
264,845
HOUSING FOR TELECOMMUNICATIONS APPARATUS
John A. Hellwig, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Apr. 14, 1980, Ser. No. 139,982
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



264,846
SHORT WAVE FACSIMILE RECEIVER
Shuhei Taguchi, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Nov. 27, 1979, Ser. No. 98,376
Claims priority, application Japan, May 31, 1979, 54-22473
Term of patent 14 years
Int. Cl. D14—*01;* D16—*03*
U.S. Cl. D14—94



264,847
DOCUMENT HANDLING AND COUNTING DEVICE
John DiBlasio, Medford, N.J., assignor to Brandt, Inc., Currency Systems Division, Cornwells Heights, Pa.
Filed Mar. 10, 1980, Ser. No. 128,473
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D14—110



264,848

SEWING MACHINE FOOT PEDAL

Susumu Hanyu, Hachioji, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan

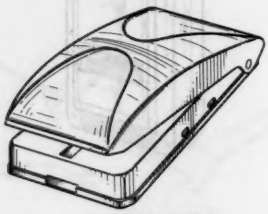
Filed Feb. 13, 1980, Ser. No. 121,251

Claims priority, application Japan, Sep. 7, 1979, 54-37475; Sep. 12, 1979, 54-38020

Term of patent 14 years

Int. Cl. D15—*99*; D13—*99*

U.S. Cl. D15—72



264,849

HOUSING FOR DRILL PRESS

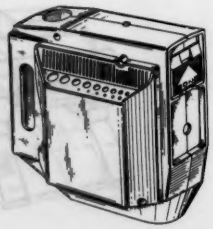
Edward A. Irelan, Columbia, Mo., assignor to Benchmark Tool Company, Jefferson City, Mo.

Filed Apr. 9, 1979, Ser. No. 28,513

Term of patent 14 years

Int. Cl. D8—*01*

U.S. Cl. D15—132



264,850

MICROFICHE READER

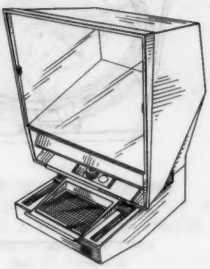
Peter J. Hall, Palgrave, Canada, assignor to Kibbutz Sheluchot, Habika, Israel

Filed Oct. 27, 1978, Ser. No. 955,163

Term of patent 14 years

Int. Cl. D16—*03*

U.S. Cl. D16—11



264,851

AUXILIARY OBJECTIVE LENS FOR A FIREARM SIGHT

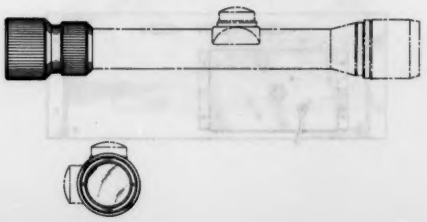
Claus O. Huckenbeck, Westlake Village, Calif., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Nov. 30, 1979, Ser. No. 98,831

Term of patent 14 years

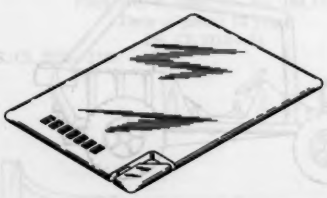
Int. Cl. D16—*06*

U.S. Cl. D16—134



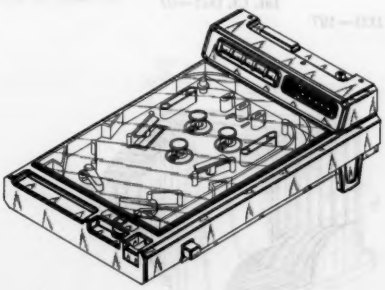
264,852
KEYBOARD STAND
Darrell A. Schoenig, 432 Clover La., Ft. Collins, Colo. 80521
Filed Jun. 2, 1980, Ser. No. 155,071
The portion of the term of this patent subsequent to Jun. 16, 1995, has been disclaimed.
Term of patent 14 years
Int. Cl. D17—*01, 99;* D6—*04*
U.S. Cl. D17—9

264,853
ELECTRONIC MEMORY CREDIT CARD WITH FRANGIBLE PORTION
Mario Scavino, and Giuseppe Marchisi, both of Milan, Italy, assignors to SGS-Ates Componenti Elettronici S.P.A., Agrate Brianza, Italy
Filed Dec. 3, 1979, Ser. No. 99,891
Claims priority, application Italy, Jun. 4, 1979, 21720/79[U]
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—10

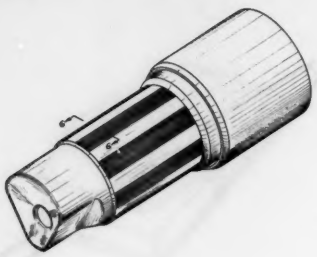


264,854
FOUNTAIN PEN
Bernt Spiegel, Edingen, Fed. Rep. of Germany, assignor to C. Joseph Lamy GmbH, Fed. Rep. of Germany
Filed Jul. 31, 1980, Ser. No. 174,219
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1980, 270
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—49

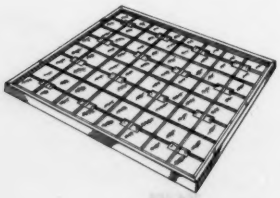
264,855
TOY PINBALL MACHINE
Tetsuo Ohkado, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Jan. 22, 1980, Ser. No. 114,189
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—10



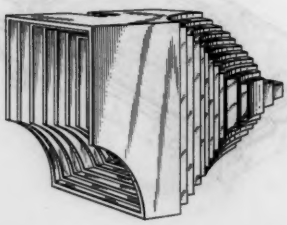
264,856
KALEIDOSCOPE
John R. Nottingham, 4875 Stacy Ct., Richmond Heights, Ohio 44143, and John W. Spirk, Jr., 2533 Euclid Heights Blvd., Cleveland Heights, Ohio 44106
Filed May 1, 1980, Ser. No. 145,795
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—60



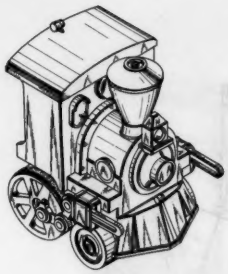
264,857
GAME BOARD
Dunbar C. Aitkens, 1460 SW. "A" St., Corvallis, Oreg. 97330
Filed Jul. 25, 1978, Ser. No. 927,900
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—16



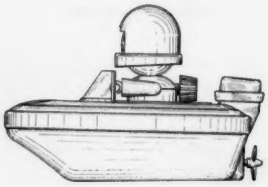
264,858
PUZZLE
Terry J. Dennis, 1602 S. Centre, San Pedro, Calif. 90731
Filed Mar. 10, 1980, Ser. No. 128,442
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—107



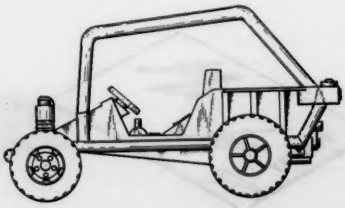
264,859
TOY LOCOMOTIVE
Masami Shiraishi, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Dec. 14, 1979, Ser. No. 103,483
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—129



264,860
COMBINED TOY BOAT AND FIGURE THEREFOR
Naoharu Yamashina, Tokyo, Japan, assignor to Kabushiki Kaisha Bandai Overseas, Tokyo, Japan
Filed Feb. 5, 1979, Ser. No. 9,052
Claims priority, application Japan, Aug. 10, 1978, 53-33916
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—130



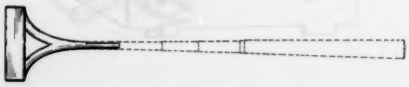
264,861
TOY VEHICLE
William J. Maloney, II, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Dec. 17, 1979, Ser. No. 104,318
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—137



264,862
EXERCISER FOR ATTACHMENT TO DOOR OR THE LIKE
Vera Kokoska, 310 Clark St., Hot Springs, Ark. 71901
Filed Nov. 13, 1979, Ser. No. 93,285
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—191

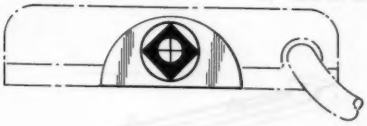
264,863
HOCKEY STICK
John A. Walmsley, 91-110 Baylor Ave., Winnipeg, Manitoba, Canada
Continuation-in-part of Ser. No. 867,376, Jan. 5, 1978, abandoned. This application Feb. 21, 1980, Ser. No. 123,125
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—210

264,864
PUTTER HEAD
Victor H. Hahn, One Bratenahl Pl., Apt. 1208, Bratenahl, Ohio 44108
Filed May 9, 1980, Ser. No. 148,400
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—218

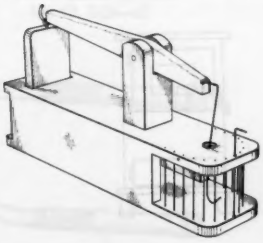


264,865
GOLF PUTTER HEAD
William H. Morgan, Sr., 26822 Via Matador, Mission Viejo, Calif. 92675
Filed Jan. 21, 1980, Ser. No. 113,693
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—219

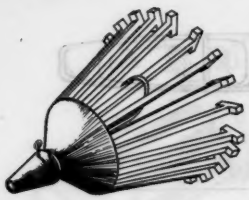
264,866
ALIGNMENT ATTACHMENT FOR A GOLF PUTTER
Frederick S. Clar, 10 Cedar La., Orinda, Calif. 94563
Filed Nov. 13, 1979, Ser. No. 93,583
Term of patent 7 years
Int. Cl. D21—*02*
U.S. Cl. D21—221



264,867
MOUSE TRAP
Roderick L. Barker, 2259 Cecelia Ter., San Diego, Calif. 92110
Filed Jun. 22, 1981, Ser. No. 276,213
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—18

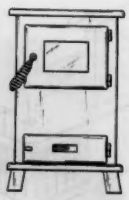


264,868
FISHING LURE
James C. Beavers, Rte. #1-Box #5, Martin, Tenn. 38237
Filed May 9, 1980, Ser. No. 148,561
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

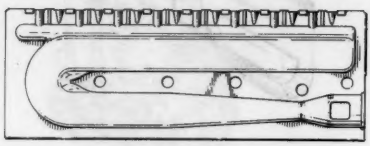


264,869
INCENSE HOLDER
Dolores L. Gordon, 7701 S. Western St., Los Angeles, Calif. 90047
Filed May 12, 1980, Ser. No. 149,110
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D23—78

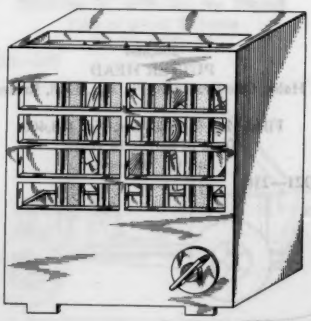
264,870
COAL BURNING STOVE
Richard A. Russo, Holbrook, Mass., assignor to Russo Manufacturing Corp., Randolph, Mass.
Filed Mar. 26, 1980, Ser. No. 134,230
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



264,871
GAS BURNER
Christopher Halstead, Accrington, England, assignor to Main Gas Appliances Limited, London, England
Filed Jul. 16, 1979, Ser. No. 57,520
Claims priority, application United Kingdom, Jan. 29, 1979, 988293
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—129



264,872
DESIGN FOR HUMIDIFIER OR THE LIKE
Steven Goodman, Teaneck, N.J., assignor to Carlan Trading Ltd., Hamilton, Bermuda
Filed Feb. 28, 1980, Ser. No. 125,717
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—146



264,873

CHEMICAL ANALYZER

Richard J. Olson, Webster, and Lawrence E. Hood, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 16, 1980, Ser. No. 160,778

Term of patent 14 years

Int. Cl. D24—*01;* D10—*04*

U.S. Cl. D24—1.1

264,874

TREATMENT COUCH TOP

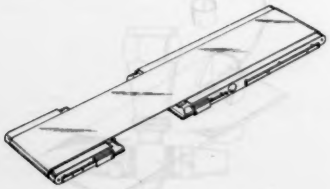
Nils E. Augustsson, Akarp; Kjell B. Westerlund, and Kay W. Stahl, both of Upsala, all of Sweden, assignors to Instrument AB Therados, Upsala, Sweden

Filed Aug. 24, 1979, Ser. No. 69,494

Term of patent 14 years

Int. Cl. D24—*99*

U.S. Cl. D24—3



264,875

COMBINED SURGICAL HEADREST AND WRIST REST

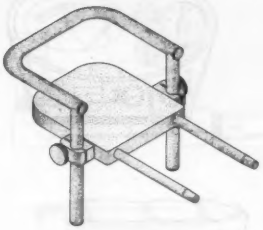
Joseph T. Crocker, Birmingham, Ala., assignor to Surgical Engineering Co., Inc., Birmingham, Ala.

Filed Nov. 16, 1979, Ser. No. 94,834

Term of patent 14 years

Int. Cl. D24—*01*

U.S. Cl. D24—7



264,876

DENTAL HANDPIECE

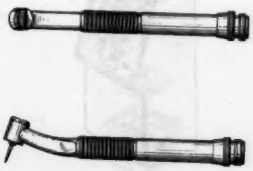
Paul Seid, New City, N.Y., assignor to Sultan Dental Products Ltd., Englewood, N.J.

Filed Jan. 17, 1980, Ser. No. 113,128

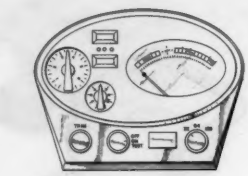
Term of patent 14 years

Int. Cl. D24—*02*

U.S. Cl. D24—12

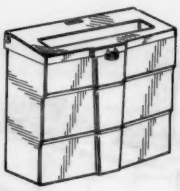


264,877
DEVICE FOR MEASURING AND INDICATING CHANGES IN RESISTANCE OF A LIVING BODY
Daniel G. Swanson, Clearwater, Fla., assignor to Lafayette R. Hubbard, East Grinstead, England
Filed Mar. 8, 1979, Ser. No. 18,845
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17



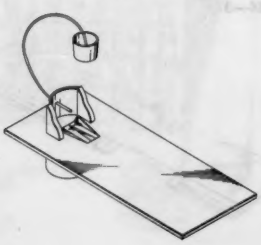
264,878
DIALYSATE DELIVERY MACHINE
Julian I. Landau, Concord, Calif., assignor to Cordis Dow Corp., Miami, Fla.
Filed May 22, 1979, Ser. No. 41,357
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—21

264,879
USED SYRINGE RECEPTACLE
Richard E. Baker, 2610 Creddy Way #D, Santa Ana, Calif. 92704
Filed Mar. 27, 1980, Ser. No. 134,741
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—31

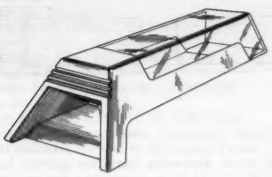


264,880
TEETHER
Richard L. Panicci, Hanover, Mass., assignor to Kiddie Products Inc., Avon, Mass.
Filed May 21, 1979, Ser. No. 40,565
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—46

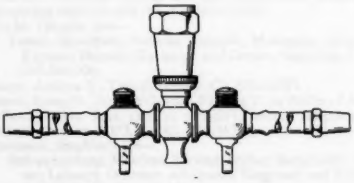
264,881
COLEMA BOARD
George A. Shaffer, 4540 Airport Rd., Redding, Calif. 96001
Filed Aug. 13, 1979, Ser. No. 66,063
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—51



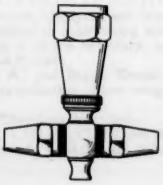
264,882
SCALPEL BLADE EXTRACTOR
Kevin Thompson, London, England, assignor to Jermed Limited, St. Helier, Channel Islands
Filed Sep. 24, 1979, Ser. No. 78,220
Claims priority, application United Kingdom, Mar. 27, 1979, 989236
Term of patent 14 years
Int. Cl. D24—*02, 99*
U.S. Cl. D24—99



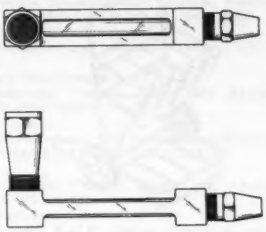
264,883
SMOKING PIPE WITH DUAL STEMS
Brad L. Irelan, 3746 S. Iowa St., St. Francis, Wis. 53207
Filed Jun. 19, 1980, Ser. No. 161,022
Term of patent 3½ years
Int. Cl. D27—*02*
U.S. Cl. D27—03



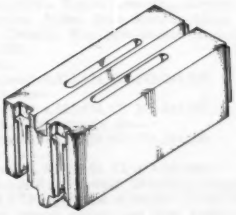
264,884
SMOKING PIPE WITH DUAL STEMS
Brad L. Irelan, 3746 S. Iowa St., St. Francis, Wis. 53207
Filed Jun. 19, 1980, Ser. No. 161,024
Term of patent 3½ years
Int. Cl. D27—*02*
U.S. Cl. D27—03



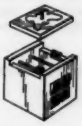
264,885
SMOKING PIPE
Brad L. Irelan, 3746 S. Iowa St., St. Francis, Wis. 53207
Filed Jun. 19, 1980, Ser. No. 161,042
Term of patent 3½ years
Int. Cl. D27—*02*
U.S. Cl. D27—3



264,886
INTERLOCKING REINFORCED BRICK
Louis Feldman, 1900 S. Palm Canyon Dr., Apt. 7, Palm Springs, Calif. 92262
Filed Apr. 30, 1980, Ser. No. 144,975
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—87



264,887
PET OBSERVATORY OR THE LIKE
Dennis O. Tweed, 420 - 21st Ave. SW., Rochester, Minn. 55901
Filed Dec. 18, 1979, Ser. No. 104,953
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1



264,888

FISHERMAN'S CART

Ronald C. Watts, 4507 Rocky River Rd., Charlotte, N.C. 28205

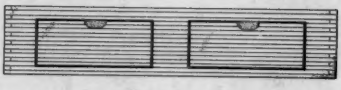
Filed Jun. 9, 1980, Ser. No. 157,965
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—26

264,889

WOOD BED FRAME OR THE LIKE

John S. Thomas, II, Raleigh, N.C., assignor to Wood Products, Inc., Raleigh, N.C.

Filed May 13, 1980, Ser. No. 149,466
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—80



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF JUNE, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Aoki & Associates: *See*—
Inaba, Seiuemon; Shimajiri, Tokiji; and Toyoda, Kenichi, 4,333,363, Cl. 74-826.000.

A. H. Robins Company, Inc.: *See*—
Walsh, David A., 4,333,951, Cl. 424-319.000.

A.P.C. Industries, Inc.: *See*—
Marks, Barry M., 4,334,227, Cl. 343-719.000.

A.R.M.: *See*—
Platt, John D., 4,333,328, Cl. 70-278.000.

A. W. Chesterton Company: *See*—
Kozlowski, Peter F., 4,333,380, Cl. 87-6.000.

AB Celleco: *See*—
Frykhult, Rune H., 4,333,572, Cl. 209-17.000.

Abe, Haruhiko; Nagatomo, Masao; Tsubouchi, Natsuro; Harada, Hiroshi; and Mitsuhashi, Junichi, to Mitsubishi Denki Kabushiki Kaisha. Method of forming patterned refractory metal films by selective oxygen implant and sublimation. 4,333,226, Cl. 29-576.00B.

Abe, Koichi; Ishihara, Masami; and Watanabe, Thuyoshi, to Mitsubishi Gas Chemical Co., Ltd. Process for producing benzene carboxylic acid ester. 4,334,080, Cl. 560-99.000.

Abrahams, Louis; and Izod, Thomas P. J., to Waters Associates, Inc. Wear-resistant article. 4,333,977, Cl. 428-131.000.

ACF Industries, Incorporated: *See*—
Hammonds, James C., 4,333,666, Cl. 280-435.000.

Acker, Otto H. Shock absorbing mechanism for a parachute supported load. 4,333,621, Cl. 244-138.00R.

Acme Burgess, Inc.: *See*—
Beiswenger, John L.; Moon, Howard R.; Chaphalkar, Dhananjay V.; and Smiesko, Frank A., 4,333,493, Cl. 137-268.000.

Acme Resin Corporation: *See*—
Craig, Robert S., 4,333,513, Cl. 164-526.000.

Acoustic Standards: *See*—
Niezgoda, Thomas A.; and Oppenheimer, Carl P., 4,333,377, Cl. 84-1.270.

Actionair Equipment Limited: *See*—
Magill, Robert J.; Lockley, Donald J.; and Perrin, Richard J., 4,333,489, Cl. 137-77.000.

Adachi, Hiroo, to Pioneer Electronic Corporation. Separately excited DC-DC converter having feedback circuit with temperature compensating effect. 4,334,263, Cl. 363-25.000.

Adachi, Takashi: *See*—
Tamai, Masaharu; Adachi, Takashi; Morimoto, Shigeo; Oguma, Kiyoshi; Hanada, Kazunori; and Omura, Sadafumi, 4,333,879, Cl. 549-549.000.

Adams, Andrea V. Toy. 4,333,642, Cl. 272-1.00D.

Adams, James R., Jr.; and Ogawa, Francis T., to Rollei of America, Inc. Photographic flash control circuitry having selectively operable internal sensor. 4,333,718, Cl. 354-31.000.

Adelmann, Siegfried: *See*—
Schreckenberg, Manfred; Freitag, Dieter; Burgdorfer, Hans-Heribert; Lehnert, Gunther; Adelmann, Siegfried; and Rudolph, Hans, 4,333,809, Cl. 204-159.140.

Adey, Walter H., to Smithsonian Institution, The. Algal turf scrubber. 4,333,263, Cl. 47-1.400.

Adin, Anthony; and Fleming, James C., to Eastman Kodak Company. Transition metal photoreduction systems and processes. 4,334,005, Cl. 430-211.000.

AFL Industries, Inc.: *See*—
Lynch, William M., 4,333,835, Cl. 210-305.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Dubois, Jacques E.; Pham, Minh-Chau; and Lacaze, Pierre C., 4,334,054, Cl. 528-210.000.

AGFA-Gevaert AG: *See*—
Bergthaller, Peter; and Sommer, Helmut, 4,334,013, Cl. 430-569.000.
Kluczynski, Achim; and Altmann, Erik, 4,333,615, Cl. 242-71.100.
Paulus, Rudolf; and Mischo, Klaus, 4,334,219, Cl. 340-712.000.

AGFA-GEVAERT N.V.: *See*—
Muylle, Wilfried E.; and Kreiter, Heinz, 4,333,372, Cl. 83-324.000.

Agrowplow Pty. Limited: *See*—
Ryan, John W., 4,333,536, Cl. 172-721.000.

Agui, Takesi; Nakajima, Masayuki; and Iwata, Koichi, to Kopia Kabushiki Kaisha. Method of determining whether or not a region in a picture is within a closed boundary, and an apparatus therefor. 4,334,274, Cl. 364-515.000.

Ahrendt, William A.; and Beggs, Donald, to Midrex Corporation. Method for direct reduction of iron using high sulfur gas. 4,333,761, Cl. 75-35.000.

Air Products and Chemicals, Inc.: *See*—
Feitler, David, 4,333,885, Cl. 260-549.000.
Tedeschi, Robert J., 4,334,091, Cl. 562-506.000.

Airco, Inc.: *See*—
Terrell, Ross C.; and Hansen, Kirsten, 4,334,105, Cl. 568-682.000.

Aiso, Hideo: *See*—
Shibasaki, Yoshihisa; Sakamura, Ken; Sakamae, Waichi; Nakano, Koichi; and Aiso, Hideo, 4,334,269, Cl. 364-200.000.

Aizawa, Tatsuo: *See*—
Miyakawa, Nobuhiro; and Aizawa, Tatsuo, 4,333,967, Cl. 427-148.000.

Ajinomoto Company Incorporated: *See*—
Nakazawa, Hidetsugu; Yamane, Ichiro; and Akutsu, Eiichi, 4,334,020, Cl. 435-110.000.

Aktiebolaget Bofors: *See*—
Bengtsson, Erik; Billingsson, Nils; Persson, Karl-Johan; and Backman, Bengt-Olov, 4,334,110, Cl. 568-932.000.

Akutsu, Eiichi: *See*—
Nakazawa, Hidetsugu; Yamane, Ichiro; and Akutsu, Eiichi, 4,334,020, Cl. 435-110.000.

Akzona Incorporated: *See*—
Beck, Heinz; Frassek, Karl H.; Giezen, Egenius A.; and Verhulst, Eduard M., 4,334,038, Cl. 525-207.000.
McNeely, Gerald W.; and Tummers, Gerardus L. J., 4,333,339, Cl. 116-217.000.
van der Burg, Willem J., 4,333,935, Cl. 424-250.000.

Alanco, Lars-Erik: *See*—
Koutonen, Pauli; and Alanco, Lars-Erik, 4,333,301, Cl. 53-587.000.

Albano, Robert N. Knockdown spacer for bookshelves and the like. 4,333,622, Cl. 248-188.800.

Albertson, Clarence E.: *See*—
Krueger, Robert H.; Albertson, Clarence E.; and Miglin, Bruce P., 4,333,516, Cl. 165-1.000.

Albertson, Robert V. Sediment indicator for liquid circulatory system. 4,333,826, Cl. 210-94.000.

Alcoa of Australia Limited: *See*—
Ikin, David D.; Butler, Paul G.; Sassella, Christopher D.; and Oliver, James K., 4,333,525, Cl. 165-104.210.

Alexander Wiegand GmbH u. Co.: *See*—
Berninger, Helmut, 4,333,348, Cl. 73-708.000.

Allada, Sambasiva R., to Dow Chemical Company, The. Submersion treatment of foamable thermoplastic sheet on preforms. 4,333,780, Cl. 156-78.000.

Allain, Christina Rita: *See*—
Allain, John C., deceased, 4,333,654, Cl. 273-241.000.

Allain, John C., deceased (Allain, Regina Gonsoulin, administratrix), to Allain, Regina Gonsoulin; Allain, John Russell; Allain, Timothy Stephen; and Allain, Christina Rita, part interest to each. Game. 4,333,654, Cl. 273-241.000.

Allain, John Russell: *See*—
Allain, John C., deceased, 4,333,654, Cl. 273-241.000.

Allain, Regina Gonsoulin: *See*—
Allain, John C., deceased, 4,333,654, Cl. 273-241.000.

Allain, Regina Gonsoulin, administratrix: *See*—
Allain, John C., deceased, 4,333,654, Cl. 273-241.000.

Allain, Timothy Stephen: *See*—
Allain, John C., deceased, 4,333,654, Cl. 273-241.000.

Allen, Eric H. W., to George Kent Limited. Moulding compositions of a styrene polymer and PTFE particles. 4,334,037, Cl. 525-199.000.

Allen, Robert W. Solar energy system and heat engine therefor. 4,333,314, Cl. 60-675.000.

Allen, Thomas H., to Optical Coating Laboratory, Inc. Optical article and method. 4,333,983, Cl. 428-336.000.

Alliance Manufacturing Company, Inc., The: *See*—
Carli, Alvin J., 4,334,161, Cl. 310-68.00E.

Allied Chemical Corporation: *See*—
Van Peppen, Jan F., 4,334,107, Cl. 568-749.000.

Allied Corporation: *See*—
Decker, Wilmot H.; and Theurer, Kurt, 4,334,102, Cl. 568-621.000.
Van De Puy, Michael; Anello, Louis G.; and Robinson, Martin A., 4,334,099, Cl. 568-386.000.
Wu, Tse C.; Prevorsek, Dusan C.; and Wertz, David H., 4,334,045, Cl. 525-439.000.

Alloy Spot Welders, Inc.: *See*—
Ittner, Nelson C.; and Rooke, William I., 4,333,598, Cl. 228-181.000.

Alps Electric Co., Ltd.: *See*—
Fujino, Hitoshi, 4,333,689, Cl. 308-3.00R.

Altenschopfer, Theodor; Schumann, Klaus; and Grodau, Dieter, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Detergent composition with a mechanical cleaning effect. 4,333,771, Cl. 134-7.000.

Altmann, Erik: *See*—
Kluczynski, Achim; and Altmann, Erik, 4,333,615, Cl. 242-71.100.

Aluminum Company of America: *See—*
Seger, Edward J.; and Haupin, Warren E., 4,333,803, Cl. 204-67.000.
Ambasz, Emilio, to Center for Design Research and Development N.V. Chair with automatically adjustable tilting back. 4,333,683, Cl. 297-292.000.
American Casting and Manufacturing Corporation: *See—*
Burnett, Ralph G., 4,333,210, Cl. 24-30.50R.
American Cyanamid Company: *See—*
Curran, William V., 4,334,062, Cl. 544-026.000.
Luedicke, Oscar B.; Domzalski, Thad; and Zajac, David, 4,333,921, Cl. 424-70.000.
Murdock, Keith C., 4,333,875, Cl. 260-239.0BC.
Nair, Vijay G.; and Bernstein, Seymour, 4,334,058, Cl. 536-8.000.
Shepherd, Robert G., 4,333,940, Cl. 424-263.000.
American Home Products Corp.: *See—*
Rakhit, Sumanas; and Bagli, Jehan F., 4,333,937, Cl. 424-251.000.
American Stabilis, Inc.: *See—*
Peters, Kenneth R., 4,333,605, Cl. 236-78.00R.
AMF Incorporated: *See—*
Vaughn, George A.; and Fuchs, Francis J., Jr., 4,333,649, Cl. 273-73.00D.
Amos, John: *See—*
Wolf, Ernest; and Amos, John, 4,333,680, Cl. 296-216.000.
AMP Incorporated: *See—*
Herrmann, Henry O., Jr., 4,333,702, Cl. 339-217.00R.
Amsted Industries Incorporated: *See—*
Kaim, John W., 4,333,576, Cl. 213-61.000.
Andeen, Gerry B.: *See—*
Siwecki, Thomas L.; and Andeen, Gerry B., 4,333,832, Cl. 210-195.200.
Anello, Louis G.: *See—*
Van De Puy, Michael; Anello, Louis G.; and Robinson, Martin A., 4,334,099, Cl. 568-386.000.
Anhalt, John W.; and Muzslay, Steven Z., to International Telephone and Telegraph Corporation. Contact retention assembly. 4,333,703, Cl. 339-217.00S.
Anic S.p.A.: *See—*
Greco, Alberto; and Bertolini, Guglielmo, 4,333,881, Cl. 260-429.00R.
Anthony, Andrew J., to Combustion Engineering, Inc. Sleeve connection for reconstitutable control rod guide tube. 4,333,798, Cl. 376-449.000.
Antiphon AB: *See—*
Melin, Lars E., 4,333,222, Cl. 29-445.000.
Antos, George J., to UOP Inc. Sulfided superactive multimetallic catalytic composite. 4,333,854, Cl. 252-439.000.
Antos, George J., to UOP Inc. Hydrocarbon isomerization catalyst and process. 4,333,856, Cl. 252-441.000.
Aoki, Eiichiro: *See—*
Okumura, Takatoshi; Nakada, Akira; Uchiyama, Yasuji; Aoki, Eiichiro; Yamaga, Eiichi; and Oya, Akiyoshi, 4,333,374, Cl. 84-1.010.
Aoki, Kiyoshi: *See—*
Takeuchi, Osamu; Aoki, Kiyoshi; and Fujii, Yuichi, 4,333,777, Cl. 148-128.000.
Aoki, Kozo; Seoka, Yoshio; and Yokota, Yukio, to Fuji Photo Film Co., Ltd. Color photographic light sensitive materials. 4,334,011, Cl. 430-552.000.
Aoki, Masaki; and Ohtani, Mitsuhiro, to Matsushita Electric Industrial Co., Ltd. Thick film varistor. 4,333,861, Cl. 252-518.000.
Aoyagi, Yoshiaki: *See—*
Matsumura, Shingo; Enomoto, Hiroshi; Aoyagi, Yoshiaki; and Shibata, Yoshihisa, 4,333,933, Cl. 424-249.000.
Aoyama, Masayoshi, to Molten Rubber Industry Co., Ltd. Inflatable game ball. 4,333,648, Cl. 273-65.0EB.
Appleton Papers Inc.: *See—*
Becker, William J.; Farber, Sheldon; and Hoover, Troy E., 4,334,072, Cl. 546-112.000.
APT Inc.: *See—*
Cummins, Charles A., II, 4,333,827, Cl. 210-100.000.
Arai, Yasunori: *See—*
Itoh, Takayuki; Ogawa, Ryota; and Arai, Yasunori, 4,333,711, Cl. 350-426.000.
Arenco-BMD Maschinenfabrik GmbH: *See—*
Schindlmayr, Peter; and Zapfel, Horst, 4,333,731, Cl. 8-436.000.
Arizona Diversified Products, Inc.: *See—*
Koberstein, Michael V., 4,333,290, Cl. 52-376.000.
Armco Inc.: *See—*
Lawson, John E., 4,333,531, Cl. 166-341.000.
Armstrong, Ernest E. Method and apparatus for cementing a casing. 4,333,530, Cl. 166-289.000.
Armstrong, Harris W.: *See—*
Deffeyes, Robert J.; and Armstrong, Harris W., 4,333,966, Cl. 427-96.000.
Arnold, Alison M., to Boeing Company, The. Rotary rack launcher with direct load path suspension. 4,333,384, Cl. 89-1.803.
Arnold, Richard L. Air drop planting system and improved planting device for same. 4,333,265, Cl. 47-74.000.
Arnswald, Jeffrey K., to Federal-Mogul Corporation. Road surfacing apparatus. 4,333,685, Cl. 299-39.000.
Arnswald, Jeffrey K., to Federal-Mogul Corporation. Road planer device with auxiliary outrigger depth control wheels. 4,333,686, Cl. 299-39.000.
Arquie, Louis; Bricot, Claude; Lehureau, Jean-Claude; Thirouard, Michel; Le Merer, Jean-Pierre; and Leterme, Dominique, to Thomson-CSF. Stigmatic optical device and an optical recording head equipped with said device. 4,334,300, Cl. 369-46.000.
Arrigoni, John P., to United Technologies Corporation. Method and apparatus for inspecting shrouds of rotor blades. 4,333,239, Cl. 33-174.00C.
Arthur, James C.; and Thieman, Graham F., to Arvin Industries, Inc. Tube-to-tube connection. 4,333,672, Cl. 285-382.200.
Arvin Industries, Inc.: *See—*
Arthur, James C.; and Thieman, Graham F., 4,333,672, Cl. 285-382.200.
Asada, Atsushi, to Sharp Kabushiki Kaisha. Wireless speech-synthesizer timepiece. 4,334,298, Cl. 368-63.000.
Asahi Glass Company, Ltd.: *See—*
Saito, Kohji; and Shibata, Hidenori, 4,333,804, Cl. 204-98.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Itoh, Takayuki; Ogawa, Ryota; and Arai, Yasunori, 4,333,711, Cl. 350-426.000.
Takami, Satoshi; Hagiwara, Teruo; Kando, Toru; and Kuroki, Yoshifumi, 4,333,719, Cl. 354-132.000.
Tomori, Yasumasa, 4,333,712, Cl. 350-430.000.
Asahi Malleble Iron Co., Ltd.: *See—*
Sugioka, Masumi; and Ogawa, Norihiro, 4,333,362, Cl. 74-812.000.
Asahi Seimitsu Kabushiki Kaisha: *See—*
Iseya, Shigeo; and Utagawa, Giichi, 4,333,245, Cl. 33-438.000.
Asai, Tsunetomo: *See—*
Suzuki, Takashi; Sawada, Hidekazu; and Asai, Tsunetomo, 4,334,022, Cl. 435-119.000.
Asano, Shoji: *See—*
Shimizu, Yasuo; Takao, Hisashi; Asano, Shoji; Shimada, Shuya; and Kikkawa, Kazutoshi, 4,334,066, Cl. 544-149.000.
Asarco Incorporated: *See—*
Di Martini, Carl R.; Scott, William L.; and Bulvanoski, Leo J., 4,333,762, Cl. 75-69.000.
Di Martini, Carl R.; Howe, Herbert E.; Scott, William L.; and Bulvanoski, Leo J., 4,333,763, Cl. 75-77.000.
Ascoli, Enzo, to Gillette Company, The. DC Electric motors. 4,334,163, Cl. 310-90.000.
ASEA Aktiebolag: *See—*
Knudsen, Lars, 4,334,264, Cl. 363-51.000.
Thorborg, Kjeld, 4,334,265, Cl. 363-72.000.
Ashida, Sakichi: *See—*
Ito, Yukio; Nagatsuma, Kazuyuki; Jyomura, Sigeru; Ashida, Sakichi; and Takeuchi, Hiroshi, 4,333,842, Cl. 252-62.900.
Aspers, Arthur J., to SPS Technologies, Inc. Method and apparatus for tightening an assembly including a pre-load indicating fastener. 4,333,220, Cl. 29-407.000.
Associated Plastics, Inc.: *See—*
Sweigart, Robert L., Jr., 4,333,580, Cl. 220-5.00A.
Athearn, Lee F., to Medtronic, Inc. Lithium-halogen batteries. 4,333,997, Cl. 429-218.000.
Atlantic Richfield Company: *See—*
Blommers, Elizabeth A.; Warfel, David R.; and Ingram, Alvin R., 4,333,970, Cl. 427-222.000.
Wright, Harold A.; and Ingram, Alvin R., 4,333,969, Cl. 427-222.000.
Atlas Copco Aktiebolag: *See—*
Ekwall, Carl G. B., 4,333,538, Cl. 173-104.000.
Atwood, John T., to Shepherd Products U.S. Inc. Twin wheel caster brake. 4,333,207, Cl. 16-35.00R.
Au, Anthony S. Pressure control systems. 4,333,452, Cl. 128-205.240.
Aument, Patrick E.: *See—*
de la Burde, Roger Z.; Aument, Patrick E.; and Utsch, Francis V., 4,333,483, Cl. 131-352.000.
Aurand, James A., to Broadcast Electronics, Inc. Second harmonic suppressor for power amplifier tank circuit. 4,334,203, Cl. 333-226.000.
Automation Industries, Inc.: *See—*
Kutnyak, Thomas A., 4,334,121, Cl. 174-68.00C.
Automobiles Peugeot: *See—*
Perez, Jean; and Carnus, Jean-Claude, 4,333,438, Cl. 123-569.000.
Avery, Stephen T.: *See—*
Green, Frederick A.; Simpson, George R.; Avery, Stephen T.; and Durbin, John A., 4,333,723, Cl. 355-71.000.
Ayers, Harry R.: *See—*
Rinker, William R.; Ayers, Harry R.; and Miller, John W., 4,333,779, Cl. 156-73.100.
Azuma, Masaaki: *See—*
Yonezawa, Kazuya; Furukawa, Hisao; and Azuma, Masaaki, 4,334,036, Cl. 525-102.000.
B.A.T. Cigaretten-Fabriken GmbH: *See—*
Pangritz, Dirk, 4,333,333, Cl. 374-8.000.
B&B Miniatures, The Whimsey: *See—*
Nye, LaVonne, 4,333,252, Cl. 38-144.000.
B. F. Goodrich Company, The: *See—*
Fisher, John M., 4,333,546, Cl. 182-48.000.
Rinker, William R.; Ayers, Harry R.; and Miller, John W., 4,333,779, Cl. 156-73.100.
Babo, Tivadar. Viticultural process and vine-dressing machine. 4,333,266, Cl. 47-58.000.
Babos, Katalin: *See—*
Plosz, Sandor; Babos, Katalin; Rozsavolgyi, Karoly; and Felfoldy, Lajos, 4,333,837, Cl. 210-602.000.
Bachmann, Rudolf: *See—*
Lehner, August; Hartmann, Heinrich; Heil, Guenter; Lenz, Werner; Buethe, Ingolf; and Bachmann, Rudolf, 4,334,034, Cl. 525-28.000.

Backman, Bengt-Olov: *See—*
Bengtsson, Erik; Billingsson, Nils; Persson, Karl-Johan; and Backman, Bengt-Olov, 4,334,110, Cl. 568-932.000.
Backo, Stevan. Power propelled reciprocating piston pump liquid sprayer. 4,333,609, Cl. 239-124.000.
Baer, Ted A.; and Labovitz, Jeffrey N., to Zoecon Corporation. Process for preparing α-ketocarboxylic acids. 4,334,087, Cl. 562-459.000.
Bagli, Jehan F.: *See—*
Rakhit, Sumanas; and Bagli, Jehan F., 4,333,937, Cl. 424-251.000.
Bahn, Michael: *See—*
Preuss, Wolfgang; Bahn, Michael; Schmid, Rolf; and Wagner, Rudiger, 4,333,880, Cl. 260-397.100.
Bailey, Ivan. Leveling stand. 4,333,244, Cl. 33-290.000.
Baker International Corporation: *See—*
Erickson, John W., 4,333,748, Cl. 55-202.000.
Baker, Richard H.; and Baumgarten, Arthur A., Jr., to Exxon Research and Engineering Company. Gated snubber circuit. 4,334,254, Cl. 361-9.000.
Baker, Wallace L.: *See—*
Helmus, Martin C.; and Baker, Wallace L., 4,333,750, Cl. 55-259.000.
Baldwin, Derek: *See—*
Gates, Peter S.; Baldwin, Derek; Wilson, Carol A.; and Gillon, John, 4,333,759, Cl. 71-88.000.
Ball Corporation: *See—*
Sullivan, Richard W.; and Nguyen, Tuan A., 4,333,246, Cl. 34-23.000.
Ballnus, Wilhelm, to Schreiber-Klaranlagen Dr.-Ing. Aug. Schreiber GmbH & Co. KG. Method and apparatus for purifying an activated sludge-waste water mixture. 4,333,838, Cl. 210-614.000.
Baltensperger, Heinz; Buhler, Karl; and Schott, Werner, to BBC Brown, Boveri & Company, Ltd. Channel furnace having a magnetic core for generating three-dimensional magnetic fields. 4,334,119, Cl. 373-159.000.
Baltz, Richard H.; Wild, Gene M.; and Seno, Eugene T., to Eli Lilly and Company. Process for producing de(mycinosyloxy)tylosin. 4,334,019, Cl. 435-76.000.
Balzers Aktiengesellschaft: *See—*
Pulker, Hans K.; and Daxinger, Helmut, 4,333,962, Cl. 427-37.000.
Baniel, Avraham M., to Miles Laboratories, Inc. Extraction of organic acids from aqueous solutions. 4,334,095, Cl. 562-584.000.
Bannon, Robert D.; and Bhansali, Mahendra M., to International Business Machines Corporation. Error correcting code system. 4,334,309, Cl. 371-38.000.
Banyasz, Joseph L., to Philip Morris Incorporated. Process for increasing filling power of reconstituted tobacco. 4,333,482, Cl. 131-300.000.
Baratz, Brenda S.; Phillips, Robert A.; and Steward, David L., to Dow Chemical Company, The. Inhibition of enveloped viruses with phenyl ketones. 4,333,941, Cl. 424-267.000.
Bard Laboratories, Inc.: *See—*
Rice, John F.; Yundt, Albert P.; and Quast, Kenneth J., 4,334,008, Cl. 430-270.000.
Barnert, Konrad: *See—*
Lohner, Ingolf; Barnert, Konrad; and Stein, Gunter, 4,333,437, Cl. 123-502.000.
Barnes, Alan C.; and Rowlands, David A., to Roussel Uclaf. Imidazoquinoxalines and pyrroloquinoxalines. 4,333,934, Cl. 424-250.000.
Barnstorf, Ingo, to Kennametal Inc. Holder for the attachment of cutters to mining and tunnelling machines. 4,333,687, Cl. 299-81.000.
Barrett, Michael G.: *See—*
Vaughan, David E. W.; and Barrett, Michael G., 4,333,859, Cl. 252-455.00Z.
Barry, James A.; and McGarry, James, to Comhlucht Siuicre Eireann Teoranta (Irish Sugar Company Limited). Process for producing dehydrated rice and product from parboiled rice. 4,333,960, Cl. 426-625.000.
Bartels, Hermann; Mez, Hans-Christian; Huber, Walter; and Stolz, Hans-Peter, to Ciba-Geigy Corporation. Mixing apparatus. 4,333,356, Cl. 73-864.210.
Barthel, Thomas C., to Medtronic, Inc. Output pulse artifact rejection in demand pacemakers. 4,333,470, Cl. 128-419.0PG.
Bartneck, Hans, to United States Shoe Corporation, The. Shoe molding process. 4,333,193, Cl. 12-142.0RS.
Basalay, Robert J.; and Udelhofen, John H., to Standard Oil Company (Indiana). Transamination process for Mannich products. 4,334,085, Cl. 564-367.000.
Bascou, Jacques, to Regie Nationale Des Usines Renault. Automatic control and locking device. 4,333,269, Cl. 49-280.000.
BASF Aktiengesellschaft: *See—*
Lehner, August; Hartmann, Heinrich; Heil, Guenter; Lenz, Werner; Buethe, Ingolf; and Bachmann, Rudolf, 4,334,034, Cl. 525-28.000.
Metzinger, Lothar; Zipp, Otmar; and Bollmann, Heinz, 4,334,033, Cl. 521-159.000.
Nagel, Peter; Schoettle, Klaus; Wittkamp, Reinrich; and Hauck, Karl, 4,333,418, Cl. 118-106.000.
Ruettiger, Wilhelm; Suetsch, Franz; and Wuerz, Albrecht, 4,333,190, Cl. 8-151.000.
Scharwaechter, Peter; Gutsche, Klaus; Kohlmann, Wilhelm; Kroemer, Gerhard, deceased; Kroemer, Norma, legal representative; Kroemer, Helmut, legal representative; and Kroemer, Maria M., legal representative, 4,333,936, Cl. 424-251.000.
Schoettle, Klaus; and Gliniorz, Lothar, 4,333,619, Cl. 242-195.000.
BASF Wyandotte Corporation: *See—*
Otten, Jay G.; Heyman, Duane A.; and Murphy, John R., 4,334,031, Cl. 521-106.000.
Patton, John T., Jr.; and Vogt, Herwart C., 4,334,032, Cl. 521-115.000.
Patton, John T., Jr.; Vogt, Herwart C.; and Parekh, Manher, 4,334,052, Cl. 528-52.000.
Ramlow, Gerhard G.; Heyman, Duane A.; and Moore, Richard A., 4,334,049, Cl. 526-202.000.
Battelle Development Corp.: *See—*
Wilkinson, William H.; and Hanna, William T., 4,333,515, Cl. 165-1.000.
Bauman, William C.: *See—*
Lee, John M.; and Bauman, William C., 4,333,846, Cl. 252-184.000.
Baumgarten, Arthur A., Jr.: *See—*
Baker, Richard H.; and Baumgarten, Arthur A., Jr., 4,334,254, Cl. 361-9.000.
Baumgartner, Kenneth A.; Melocik, Grant C.; and Stoller, Keith A., to Towmotor Corporation. Method of and means for controlling electrical devices. 4,334,176, Cl. 318-102.000.
Baumoel, Joseph. Two-transducer Doppler flowmeter with swept oscillator. 4,333,353, Cl. 73-861.250.
Baxter Travenol Laboratories, Inc.: *See—*
Jones, William L.; and Christensen, Jon A., 4,333,505, Cl. 141-383.000.
Bay, William P. Helmet visor. 4,333,180, Cl. 2-10.000.
Bayer Aktiengesellschaft: *See—*
Diehr, Hans-Joachim, 4,334,073, Cl. 546-245.000.
Freitag, Dieter; Reinking, Klaus; Idel, Karsten; Medem, Harald; and Bottenbruch, Ludwig, 4,334,053, Cl. 528-179.000.
Konig, Joachim; and Suling, Carlhans, 4,334,046, Cl. 526-93.000.
Neeff, Rutger, 4,334,068, Cl. 544-187.000.
Nickel, Horst; Muller, Friedhelm; and Mummenhoff, Peter, 4,333,874, Cl. 260-153.000.
Schreckenberg, Manfred; Freitag, Dieter; Burgdorfer, Hans-Heribert; Lehnert, Gunther; Adelmann, Siegfried; and Rudolph, Hans, 4,333,809, Cl. 204-159.140.
BBC Brown, Boveri & Company, Ltd.: *See—*
Baltensperger, Heinz; Buhler, Karl; and Schott, Werner, 4,334,119, Cl. 373-159.000.
Germann, Willy, 4,333,223, Cl. 29-447.000.
Koch, Alfred, 4,333,228, Cl. 29-599.000.
Beach, David L.: *See—*
Pellegrini, John P., Jr.; Beach, David L.; and Kobylinski, Thaddeus P., 4,334,113, Cl. 585-18.000.
Beaucamp, Klaus: *See—*
Gauhl, Helmgard; Schawohl, Georg; Seidel, Hans; and Beaucamp, Klaus, 4,334,023, Cl. 435-190.000.
Becht, Cletus A.: *See—*
Hogan, James M.; and Becht, Cletus A., 4,333,899, Cl. 264-51.000.
Beck, Heinz; Frassek, Karl H.; Giezen, Egenius A.; and Verhulst, Eduard M., to Akzona Incorporated. Shaping of plastic materials containing polymeric lubricant. 4,334,038, Cl. 525-207.000.
Beck, James R.; and Yahner, Joseph A., to Eli Lilly and Company. Method for improving the efficiency of ruminant feed utilization. 4,333,923, Cl. 424-115.000.
Beck, Jeffrey L.; and Sweeney, William T., to Conoco Inc. Pressure dissipation apparatus. 4,333,499, Cl. 137-812.000.
Becker, Michael. Intramuscular injection device suitable for insulin injections. 4,333,459, Cl. 128-218.00F.
Becker, William J.; Farber, Sheldon; and Hoover, Troy E., to Appleton Papers Inc. Lactone compounds containing an indolizine radical. 4,334,072, Cl. 546-112.000.
Beecham Group Limited: *See—*
Bowley, Inez; and Harrison, Raymond G., 4,333,924, Cl. 424-170.000.
Cantello, Barrie C. C., 4,333,929, Cl. 424-246.000.
McDonald, Brian G., 4,333,952, Cl. 424-330.000.
Beesley, Graham E., to Motorola, Inc. Noise blanking circuitry in a radio receiver. 4,334,317, Cl. 455-194.000.
Beggs, Donald: *See—*
Ahrendt, William A.; and Beggs, Donald, 4,333,761, Cl. 75-35.000.
Beiersdorf Aktiengesellschaft: *See—*
Muller, Heinz; Jauchen, Peter; Szonn, Bodo; and Schulze, Rolf, 4,333,449, Cl. 128-155.000.
Beig, Willy, to Zahnradfabrik Friedrichshafen. Gear shifter mounted on steering column of heavy-duty vehicle. 4,334,130, Cl. 200-61.540.
Beiswenger, John L.; Moon, Howard R.; Chaphalkar, Dhananjay V.; and Smiesko, Frank A., to Acme Burgess, Inc. Cartridge feeder for soluble fertilizer. 4,333,493, Cl. 137-268.000.
Belanger, Patrice C.; Rokach, Joshua; Young, Robert N.; and Scheigetz, John, to Merck & Co., Inc. Stereospecific sulfoxidation of dibenzo thiepins. 4,334,077, Cl. 549-12.000.
Bell Telephone Laboratories, Incorporated: *See—*
Boyd, Gary D.; Cheng, Julian; and Ngo, Peter D. T., 4,333,708, Cl. 350-346.000.
Freeman, Richard R.; and White, Jonathan C., 4,334,200, Cl. 372-90.000.
Geusic, Joseph E.; Muehlner, Dirk J.; and Nelson, Terence J., 4,334,291, Cl. 365-36.000.
Gitlin, Richard D.; and Meadors, Howard C., Jr., 4,334,313, Cl. 375-106.000.
Lifshitz, Nadia; Moran, Joseph M.; and Wang, David N., 4,333,793, Cl. 156-643.000.
Pugh, William E., III, 4,333,700, Cl. 339-97.00R.

Bellafiore, Francis V.; Duff, Michael P.; and O'Meara, David M., to Chicago Bridge & Iron Company. Insulating machine and process. 4,333,973, Cl. 427-424.000.

Belletire, John L., to Pfizer Inc. Organic diamine therapeutic compositions and methods. 4,333,932, Cl. 424-248.560.

Ben Pearson Archery Inc.: *See*—
Roelle, David, 4,333,443, Cl. 124-24.00R.

Bendix Corporation, The: *See*—
Hegg, Billy S., 4,333,390, Cl. 91-467.000.
Hendrickson, Richard T.; and Carter, Joel S., 4,333,668, Cl. 280-703.000.

Bengtsson, Erik; Billingsson, Nils; Persson, Karl-Johan; and Backman, Bengt-Olov, to Aktiebolaget Bofors. Method of producing symmetrical trinitrobenzene. 4,334,110, Cl. 568-932.000.

Bennet, Joseph C.: *See*—
Funcik, Jack F.; Bennet, Joseph C.; Tubbs, Joseph T.; and Schneider, Thomas E., 4,333,230, Cl. 29-749.000.

Bennett, Donald C. Composite rotary tool including hole forming means and a deburrer or chamferer. 4,333,727, Cl. 408-191.000.

Bennett, Moreland P., to General Electric Company. Bimetallic electrical connector and method for making such connector. 4,334,122, Cl. 174-94.00R.

Berger, Leo; and Olson, Gary L., to Hoffmann-La Roche Inc. Cycloalka[4,5]pyrrolo[2,3-g]isoquinolines. 4,334,070, Cl. 546-70.000.

Berger, Leo; Plati, John T.; and Ziering, Albert, to Hoffmann-La Roche Inc. Dibenzothiophenes. 4,334,078, Cl. 549-43.000.

Bergthaller, Peter; and Sommer, Helmut, to AGFA-Gevaert AG. Use of copolymers in the production of photographic emulsions and photographic materials. 4,334,013, Cl. 430-569.000.

Bergwerksverband GmbH: *See*—
Kolling, Georg; Romey, Ingo; and Kokot, Hellmut, 4,333,816, Cl. 208-91.000.

Berlin, Christian: *See*—
Hoppe, Klaus; Muller, Jurgen; Keller, Jurgen; Kulbe, Bernd; Lessig, Klaus; Berlin, Christian; and Danke, Eckhard, 4,333,894, Cl. 261-96.000.

Bernard, Andre: *See*—
Buathier, Bernard; and Bernard, Andre, 4,334,083, Cl. 560-226.000.

Berninger, Helmut, to Alexander Wiegand GmbH u. Co. Liquid-filled pressure gauge. 4,333,348, Cl. 73-708.000.

Bernot, Jean, to Trefilunion S.A. Process and apparatus for descaling rod. 4,333,275, Cl. 51-320.000.

Bernstein, Seymour: *See*—
Nair, Vijay G.; and Bernstein, Seymour, 4,334,058, Cl. 536-8.000.

Bertea Corporation: *See*—
Seitz, Clyde R., 4,333,387, Cl. 91-1.000.

Bertin, Marcel R.; Boutmy, Patrick E.; Le Fort, Gilbert J.; and Walraet, Jean G., to Societe Anonyme de Telecommunications. Monitoring system for telecommunication links equipped with repeaters-regenerators. 4,334,303, Cl. 370-13.000.

Bertolini, Guglielmo: *See*—
Greco, Alberto; and Bertolini, Guglielmo, 4,333,881, Cl. 260-429.00R.

BESAM-EADS, Inc.: *See*—
Catlett, John C., 4,333,270, Cl. 49-336.000.

Besson, Raymond J.; and Valentin, Jean P., to Etat Francais. High frequency, thermostatically self controlled oscillator. 4,334,168, Cl. 310-343.000.

Bethlehem Steel Corporation: *See*—
Wajtkowicz, Joseph A., 4,333,636, Cl. 266-68.000.

Bettarini, Franco; Massardo, Pietro; Piccardi, Paolo; and Longoni, Angelo, to Montedison S.p.A. Hydroquinone diether having juvenile hormone and acaricide activity. 4,334,104, Cl. 568-649.000.

Beyer, Klaus D.; and Logan, Joseph S., to International Business Machines Corporation. Omission of thick Si_3N_4 layers in ISA schemes. 4,333,794, Cl. 156-648.000.

Bhansali, Mahendra M.: *See*—
Bannon, Robert D.; and Bhansali, Mahendra M., 4,334,309, Cl. 371-38.000.

Bhattacharya, Debanshu; Quinto, Dennis T.; and Holowaty, Michael O., to Inland Steel Company. Semi-finished steel article. 4,333,776, Cl. 148-36.000.

Bhattacharyya, Arup; Chu, Wei-Kan; Howard, James K.; and Wiedman, Francis W., to International Business Machines Corporation. Method for manufacture of ultra-thin film capacitor. 4,333,808, Cl. 204-192.00D.

Bibollet, Jean-Claude. Snap-hook, particularly for mountaineering. 4,333,212, Cl. 24-233.000.

Bickford, John H., to Raymond Engineering Inc. Method and apparatus for measuring the residual tension in a stud or a bolt. 4,333,351, Cl. 73-761.000.

Bieber, Albert G.: *See*—
Brown, William F.; and Bieber, Albert G., 4,333,824, Cl. 208-326.000.

Bieber, Theo: *See*—
Schleyer, Herbert; and Bieber, Theo, 4,333,308, Cl. 57-339.000.

Bihler, Otto; and Bruller, Eduard, to Bihler, Otto. Feeder for feeding stock to machines or devices. 4,333,593, Cl. 226-122.000.

Bill, Colin S.; Cockshott, Charles P.; and Francis, John H., to Lucas Industries Limited. Linear displacement transducer. 4,334,207, Cl. 336-136.000.

Billard, Jean: *See*—
Dubois, Jean-Claude; Zann, Annie; Billard, Jean; and Hareng, Michel, 4,333,709, Cl. 350-350.00R.

Billings, David L.; Fey, Robert M.; and Waugh, Richard A., to General Electric Company. Mount for washing machine. 4,333,322, Cl. 68-23.200.

Billingsfors Bruks Aktiebolag: *See*—
Fuxelius, Kaj O. H., 4,333,726, Cl. 405-72.000.

Billingsson, Nils: *See*—
Bengtsson, Erik; Billingsson, Nils; Persson, Karl-Johan; and Backman, Bengt-Olov, 4,334,110, Cl. 568-932.000.

Binder, Johann V.: *See*—
Zahra, Frank G.; and Binder, Johann V., 4,333,533, Cl. 172-155.000.

Bio Logicals Inc.: *See*—
Ogilvie, Kelvin K., 4,334,059, Cl. 536-23.000.

Bischoff, Walter, to Gelenkwellenbau GmbH. Universal joint assembly. 4,333,319, Cl. 464-26.000.

Bison-Werke Bahre und Greten GmbH & Co., KG: *See*—
Nass, Arno, 4,333,767, Cl. 106-161.000.

Bissell, Inc.: *See*—
Yonkers, Robert A., 4,333,203, Cl. 15-321.000.

BJ-Hughes Inc.: *See*—
Herst, Neil W., 4,333,209, Cl. 24-263.0DA.

Blackmore, Douglas. Skin effect pipe heating system utilizing convective and conductive heat transfer. 4,334,142, Cl. 219-301.000.

Blais, Marcel, to United States of America, Army. Reactor for the gas phase nitration of cellulose. 4,334,060, Cl. 536-35.000.

Blaupunkt-Werke GmbH: *See*—
Liman, Helmut, 4,334,320, Cl. 455-227.000.

Blickenderfer, Charles, to Weyerhaeuser Company. Positioning and feed system for cants and boards. 4,333,373, Cl. 83-419.000.

Bloch, Herman S.: *See*—
Kulprathipanja, Santi; and Bloch, Herman S., 4,333,768, Cl. 127-46.200.

Block, Thomas S., to McGraw-Edison Company. Floor scrubber with combined solution and recovery tank. 4,333,202, Cl. 15-320.000.

Bloeck, Siegfried; Hofling, Erich; Luthi, Rudolf; and Diemi, Werner, to Swiss Aluminium Ltd. Grooved beverage can lid. 4,333,582, Cl. 220-66.000.

Blommers, Elizabeth A.; Warfel, David R.; and Ingram, Alvin R., to Atlantic Richfield Company. Process for producing coated beads with macromonomer-styrene polymerizate coating. 4,333,970, Cl. 427-222.000.

Boblett, Arthur P., to United States of America, Navy. Leaky waveguide continuous slot antenna. 4,334,229, Cl. 343-767.000.

Boden, Richard M., to International Flavors & Fragrances Inc. 1-n-Butoxy-1-ethanol acetate and uses thereof for augmenting or enhancing the aroma or taste of consumable materials. 4,333,481, Cl. 131-276.000.

Bodicky, Raymond O., to Sherwood Medical Industries Inc. Injectable catheter and method of placing same. 4,333,455, Cl. 128-214.400.

Bodnar, Louis G.: *See*—
Gavasso, John M.; Bodnar, Louis G.; and Parker, Walter E., 4,333,426, Cl. 123-90.270.

Boeglin, Paul H.; and Chigot, Claude R., to Societe Nationale Industrielle Aerospatiale. Plate-glass fitted with an explosion-cutting device. 4,333,381, Cl. 89-1.00B.

Boehringer Ingelheim GmbH: *See*—
Weber, Karl-Heinz; Langbein, Adolf; Lehr, Erich; Boke, Karin; and Kuhn, Franz J., 4,333,944, Cl. 424-269.000.

Boehringer Mannheim GmbH: *See*—
Gauhl, Helmgard; Schawohl, Georg; Seidel, Hans; and Beaucamp, Klaus, 4,334,023, Cl. 435-190.000.
Kirchhof, Bruno, 4,334,018, Cl. 435-13.000.

Boeing Company, The: *See*—
Arnold, Alison M., 4,333,384, Cl. 89-1.803.
Buchanan, John A., 4,334,204, Cl. 335-205.000.
Huling, Don W., 4,333,498, Cl. 137-625.620.
Shefrin, Joseph, 4,333,551, Cl. 188-372.000.

Bohlen, Harald; Engelke, Helmut; Kulcke, Werner; Nehmiz, Peter; and Greschner, Johann, to International Business Machines Corporation. Method of shadow printing exposure. 4,334,156, Cl. 250-491.000.

Boke, Karin: *See*—
Weber, Karl-Heinz; Langbein, Adolf; Lehr, Erich; Boke, Karin; and Kuhn, Franz J., 4,333,944, Cl. 424-269.000.

Bollmann, Heinz: *See*—
Metzinger, Lothar; Zipp, Otmar; and Bollmann, Heinz, 4,334,033, Cl. 521-159.000.

Bolton, Theodore S.: *See*—
Lang, Richard D.; and Bolton, Theodore S., 4,333,206, Cl. 16-335.000.

Bomatic, Inc.: *See*—
Hestehave, Borge; and Hestehave, Kjeld, 4,333,905, Cl. 264-529.000.

Bond, James W.; and Whitehouse, Harper J., to United States of America, Navy. High-accuracy multipliers using analog and digital components. 4,334,277, Cl. 364-703.000.

Bonet, Claude: *See*—
Moisset, Jacques; Bonet, Claude; Rouanet, Alain; Petit, Alain; and Delmas, Robert, 4,333,766, Cl. 106-100.000.

Boney, Joel F.; Rupp, Edward J., II; and Thomas, James S., to Motorola, Inc. Microcomputer with branch on bit set/clear instructions. 4,334,268, Cl. 364-200.000.

Booher, Robert K. Priority determining network having user arbitration circuits coupled to a multi-line bus. 4,334,288, Cl. 364-900.000.

Booth, Geoffrey, to Flexitallic Gaskets Limited. Flat gasket laminate of expanded graphite foil and metallic reinforcement layer. 4,333,975, Cl. 428-65.000.

Borg-Warner Corporation: *See—*
Krueger, Robert H.; Albertson, Clarence E.; and Miglin, Bruce P., 4,333,516, Cl. 165-1.000.
Krueger, Robert H., 4,333,850, Cl. 252-389.00A.
LaMarche, Paul E., 4,333,552, Cl. 192-3.290.
Simmons, John P., 4,333,360, Cl. 74-473.00P.

Bosch, Hubert, to Vat Aktiengesellschaft fur Vakuum-Apparate-Technik. Pipe valve assembly with metal valve slide for high vacuum installations. 4,333,631, Cl. 251-159.000.

Bossier, Joseph A., III, to Ethyl Corporation. Process for recovery of polyol fatty acid polyesters. 4,334,061, Cl. 536-119.000.

Bottenbruch, Ludwig: *See—*
Freitag, Dieter; Reinking, Klaus; Idel, Karsten; Medem, Harald; and Bottenbruch, Ludwig, 4,334,053, Cl. 528-179.000.

Bouette, Rodger D., to Repco Research Pty. Ltd. Image development method. 4,334,002, Cl. 430-103.000.

Bougaran, Alain P., to Compagnie Chambon. Device and method of trans-shipment between a ship and a fixed structure situated at sea. 4,333,196, Cl. 14-71.700.

Boulanger, Henry J.; and McGuirk, Andrew C., to Texas Instruments Incorporated. Thermostatic switch and method of making. 4,334,210, Cl. 337-343.000.

Bourasseau, Daniel J. E.: *See—*
Nard, Georges P.; Bourasseau, Daniel J. E.; and Rabian, Jean M., 4,334,314, Cl. 375-111.000.

Bourgeois, David R.; Ryan, James A.; and Varshney, Subhash C., to Honeywell Information Systems Inc. Data processing system with self testing and configuration mapping capability. 4,334,307, Cl. 371-16.000.

Boutmy, Patrick E.: *See—*
Bertin, Marcel R.; Boutmy, Patrick E.; Le Fort, Gilbert J.; and Walraet, Jean G., 4,334,303, Cl. 370-13.000.

Bowley, Inez; and Harrison, Raymond G., to Beecham Group Limited. Retinol acetate skin-care compositions. 4,333,924, Cl. 424-170.000.

Boyd, Gary D.; Cheng, Julian; and Ngo, Peter D. T., to Bell Telephone Laboratories, Incorporated. Mechanically multistable liquid crystal cell. 4,333,708, Cl. 350-346.000.

BP Chemicals Limited: *See—*
Speakman, John G.; and Wilkinson, Nicholas P., 4,333,851, Cl. 252-429.00B.

Bracco, Umberto; and Viret, Jean-Louis, to Societe d'Assistance Technique pour Produits Nestle S.A. Decholesterization of egg-yolk. 4,333,959, Cl. 426-614.000.

Brady, Michael: *See—*
Lim, John; Brady, Michael; and Stamires, Dennis, 4,333,857, Cl. 252-455.00Z.

Brain, Sally A.: *See—*
Robinson, Joseph G.; and Brain, Sally A., 4,334,055, Cl. 528-229.000.

Brainerd, Michael G.: *See—*
Frazier, John D.; Grandfield, Wilmur G.; and Brainerd, Michael G., 4,334,215, Cl. 340-539.000.

Bramm, Guenter; and Novak, Pavel, to Speidel & Keller GmbH & Co. KG. Electromagnetic driving mechanism for oscillating displacement pumps. 4,334,180, Cl. 318-687.000.

Bredow, Reinhard, to Siemens Aktiengesellschaft. Antenna system for locating a microwave signal source. 4,334,225, Cl. 343-100.0LE.

Bremer, Noel J.: *See—*
Milberger, Ernest C.; Bremer, Noel J.; and Dria, Dennis E., 4,333,853, Cl. 252-435.000.

Breslow, Jeffrey D.: *See—*
Jaworski, Eugene; Disko, Harry; and Breslow, Jeffrey D., 4,333,657, Cl. 273-376.000.

Bricot, Claude: *See—*
Arquie, Louis; Bricot, Claude; Lehureau, Jean-Claude; Thirouard, Michel; Le Merer, Jean-Pierre; and Leterme, Dominique, 4,334,300, Cl. 369-46.000.

Brink, E. R., Jr.: *See—*
Hansard, Robert C.; and Brink, E. R., Jr., 4,333,563, Cl. 206-53.000.

British Petroleum Company Limited, The: *See—*
Ellis, John F. G., 4,334,114, Cl. 585-407.000.

Broadcast Electronics, Inc.: *See—*
Aurand, James A., 4,334,203, Cl. 333-226.000.

Broerman, Arthur B., to Phillips Petroleum Company. Fluid actuated valve. 4,333,500, Cl. 137-863.000.

Bronder, David G.: *See—*
Munoz, Donald L.; Grote, Daniel A.; Bronder, David G.; and Weis, Gerald J., 4,333,678, Cl. 296-39.00R.

Brooks, Philip A. Moving picture apparatus. 4,333,715, Cl. 352-98.000.

Brorein, William J., to GK Technologies, Incorporated. Flat telephone cord plug improvements. 4,333,699, Cl. 339-61.00M.

Brother Kogyo Kabushiki Kaisha: *See—*
Onishi, Heizo, 4,333,791, Cl. 156-580.100.

Brown, Bill G.: *See—*
Schreck, Raymond M.; Brown, Bill G.; and Gilda, David A., 4,333,588, Cl. 222-164.000.

Brown, Stanford M. Method for handling and baling metallic scrap material. 4,333,394, Cl. 100-42.000.

Brown, William F.; and Bieber, Albert G., to Texaco Inc. Refining highly aromatic lube oil stocks. 4,333,824, Cl. 208-326.000.

Bruce, Calvin A.; Homola, Andrew M.; and Lorenz, Max R., to International Business Machines Corporation. Preparation of thin, aligned magnetic coatings. 4,333,961, Cl. 427-13.000.

Bruller, Eduard: *See—*
Bihler, Otto; and Bruller, Eduard, 4,333,593, Cl. 226-122.000.

Brunais, Ellsworth G.; and McCombie, Jay C., to Chrysler Corporation. Fuel injection system, control valve and electronic control circuit. 4,333,434, Cl. 123-478.000.

Brune, Heinz. Casings for heat exchangers and burner/recuperator assemblies incorporating such casings. 4,333,522, Cl. 165-69.000.

Bruns, Klaus: *See—*
Hagen, Jens; and Bruns, Klaus, 4,334,100, Cl. 568-444.000.

Brunswick Corporation: *See—*
Kusche, David W., 4,333,425, Cl. 123-73.00R.

Bryce, Jerry H.: *See—*
Kaplan, Howard I.; Bryce, Jerry H.; Johnston, Thomas J.; McMinn, Curtis J.; Willett, John T.; and Richards, Nolan E., 4,333,813, Cl. 204-243.00R.

Buathier, Bernard; and Bernard, Andre, to Rhone-Poulenc Agrochimie. Process for the preparation of an alkyl 2-chloropropionate by chlorinating an alkyl lactate. 4,334,083, Cl. 560-226.000.

Buchanan, Bobby L. Method of fabricating polysilicon/silicon junction field effect transistors. 4,333,224, Cl. 29-571.000.

Buchanan, John A., to Boeing Company, The. Proximity switch assembly. 4,334,204, Cl. 335-205.000.

Buckler, Robert T.; and Schroeder, Hartmut R., to Miles Laboratories, Inc. Chemiluminescent phthalhydrazide-labeled hapten conjugates. 4,334,069, Cl. 544-237.000.

Budzich, Tadeusz. Load responsive fluid control valve. 4,333,389, Cl. 91-446.000.

Buethe, Ingolf: *See—*
Lehner, August; Hartmann, Heinrich; Heil, Guenter; Lenz, Werner; Buethe, Ingolf; and Bachmann, Rudolf, 4,334,034, Cl. 525-28.000.

Buettner, Carl F.; and Hill, John S. Vehicle bumpers with collapsible parts. 4,333,674, Cl. 293-120.000.

Bugaut, Andree; Shahin, Majdi M.; Vandenbossche, Jean-Jacques H.; and Kalopissis, Gregoire, to Societe Anonyme dite: L'Oreal. Metaphenylenediamines, dyeing compositions in which they are present and the corresponding dyeing process. 4,333,730, Cl. 8-407.000.

Buhler, Karl: *See—*
Baltensperger, Heinz; Buhler, Karl; and Schott, Werner, 4,334,119, Cl. 373-159.000.

Buhs, Rudolf P.; Jacob, Theodore A.; Miwa, Gerald; Sestokas, Elena; Taub, Rae; and Walsh, John S., to Merck & Co., Inc. Derivatives of C-076 compounds. 4,333,925, Cl. 424-181.000.

Bukamier, Gary L.; and Rupert, Steven L. Orientation-insensitive electrode. 4,333,812, Cl. 204-195.00G.

Bulvanoski, Leo J.: *See—*
Di Martini, Carl R.; Scott, William L.; and Bulvanoski, Leo J., 4,333,762, Cl. 75-69.000.
Di Martini, Carl R.; Howe, Herbert E.; Scott, William L.; and Bulvanoski, Leo J., 4,333,763, Cl. 75-77.000.

Bunnell, Charles A.: *See—*
Greene, James M.; and Bunnell, Charles A., 4,334,079, Cl. 560-75.000.

Burgdorfer, Hans-Heribert: *See—*
Schreckenberg, Manfred; Freitag, Dieter; Burgdorfer, Hans-Heribert; Lehnert, Gunther; Adelmann, Siegfried; and Rudolph, Hans, 4,333,809, Cl. 204-159.140.

Buriks, Rudolf S.: *See—*
Naiman, Michael I.; and Buriks, Rudolf S., 4,333,741, Cl. 44-62.000.

Burillo, Antonio; and Dane, Richard, II. Internal combustion engine. 4,333,427, Cl. 123-190.00A.

Burnett, Ralph G., to American Casting and Manufacturing Corporation. Sealing device. 4,333,210, Cl. 24-30.50R.

Burr, Orville R.: *See—*
Wyner, Elliott F.; Burr, Orville R.; and Garrison, Robert L., 4,334,172, Cl. 315-289.000.

Burrell, Gordon M. Method and finger ring device for snelling a fishhook. 4,333,257, Cl. 43-57.50R.

Burroughs Corporation: *See—*
Peter, Emmett B., III, 4,333,641, Cl. 271-289.000.
Potash, Hanan, 4,334,213, Cl. 340-347.0DD.
Turnbull, David F., 4,334,276, Cl. 364-561.000.

Bush, Randall G., to Sunbeam Plastics Corporation. Child-resistant overcap for a pressurized container. 4,333,589, Cl. 222-402.110.

Busquets, Agustin A. Faucet assembly with mixing valve. 4,333,497, Cl. 137-625.170.

Butler, Paul G.: *See—*
Ikin, David D.; Butler, Paul G.; Sassella, Christopher D.; and Oliver, James K., 4,333,525, Cl. 165-104.210.

Byers, Charles M.; and Numbers, Jody L., to Byers, Charles M. Hand grenade. 4,333,401, Cl. 102-487.000.

Byk Gulden Lomberg Chemische Fabrik Gesellschaft: *See—*
Krass, Ekkehard; and Wolf, Horst, 4,334,089, Cl. 562-463.000.

BYK Gulden Lomberg Chemische Fabrik GmbH: *See—*
Eistetter, Klaus; Kley, Hans-Peter; Menge, Heinz-Gunter; and Schaefer, Hartmann, 4,333,942, Cl. 424-267.000.

Byrne, Richard J.: *See—*
Moreno, John R.; Byrne, Richard J.; and Shakespeare, Charles B., 4,333,475, Cl. 128-711.000.

C.A. Greiner & Sohne GmbH & Co. KG: *See—*
Krieg, Karl, 4,333,478, Cl. 128-764.000.

California R & D Center: *See—*
Jones, Lawrence T.; Sims, Anson; Howden, Ashley G.; Knighton, Mark S.; Kingsbury, L. C. James; and Conroy, Richard F. M., 4,333,261, Cl. 46-257.000.

Calor Agriculture Research, Inc.: *See—*
Juengst, Fred W., Jr.; and Dika, John A., 4,333,956, Cl. 426-69.000.

Camp, Neal H.; Paetz, James E.; and Patterson, Nicholas L. Coating system. 4,333,417, Cl. 118-50.000.

Campolmi, Stefano; Carletti, Vittorio; and Marchi, Marcello, to Montedison S.p.A. Process for preparing N-methylcarbamate of methylthioacetaldoxime. 4,333,882, Cl. 260-453.300.

Canada, Her Majesty the Queen in right of, as represented by Minister of National Defence of Her Majesty's Canadian Government: *See*—
Cornish, William D.; and Gauthier, Francois A., 4,334,202, Cl. 333-218.000.

Canon Kabushiki Kaisha: *See*—
Sakane, Toshio; Hosoe, Kazuya; Tsunekawa, Tokuichi; Kinoshita, Takao; and Kawabata, Takashi, 4,333,716, Cl. 354-25.000.
Shirato, Yoshiaki; Takatori, Yasushi; Hara, Toshitami; Nishimura, Yukuo; and Takahashi, Michiko, 4,334,234, Cl. 346-140.00R.
Suzuki, Ryoichi; and Uchiyama, Takashi, 4,333,720, Cl. 354-227.000.
Suzuki, Ryoichi; Uchiyama, Takashi; Hosoe, Kazuya; and Tsunekawa, Tokuichi, 4,334,220, Cl. 340-753.000.
Tamura, Shuichi, 4,333,717, Cl. 354-25.000.
Yoshida, Syozo; and Sugiura, Yoji, 4,333,721, Cl. 354-234.000.

Cantello, Barrie C. C., to Beecham Group Limited. Carboxamidine derivatives and hypoglycemical use. 4,333,929, Cl. 424-246.000.

Carbone, Nazzareno E. Apparatus for comparing the distance of two balls from a third ball. 4,333,237, Cl. 33-143.00R.

Cardone, Joseph T.; Shatz, Kenneth J.; and Dill, James M., to Ecological Energy Systems, Inc. Gas powered, closed loop power system and process for using same. 4,333,313, Cl. 60-649.000.

Cardoza, Richard E.; and Crowe, William D., to J. R. Schneider Co., Inc. Filter system with improved blowdown collection and recirculation means. 4,333,839, Cl. 210-777.000.

Carey, James J., to Chloride Electro Networks, Division of Chloride, Inc., N. American Operation. Process for manufacture of high voltage transformers and the like. 4,333,900, Cl. 264-85.000.

Carey, John L.; and Greenhalgh, Colin W., to Imperial Chemical Industries Limited. Substituted 2,7-dioxo-2,7-dihydrobenzo[1:2-b; 5:6-b^1]difuran or -dipyrrole dyestuffs, their preparation and their use. 4,333,877, Cl. 548-421.000.

Carl Cloos Verwaltungsgesellschaft oHG: *See*—
Cloos, Erwin, 4,333,594, Cl. 226-176.000.

Carletti, Vittorio: *See*—
Campolmi, Stefano; Carletti, Vittorio; and Marchi, Marcello, 4,333,882, Cl. 260-453.300.

Carli, Alvin J., to Alliance Manufacturing Company, Inc., The. Centrifugal switch and motor control. 4,334,161, Cl. 310-68.00E.

Carlson, Raymond A. Mailbox with lockable letter mail compartment for use in motorized delivery routes. 4,333,603, Cl. 232-17.000.

Carney, James A.; and McGregor, Adrienne R., to Technicon Instruments Corporation. Radioassay for vitamin B_{12}. 4,333,918, Cl. 424-1.000.

Carnus, Jean-Claude: *See*—
Perez, Jean; and Carnus, Jean-Claude, 4,333,438, Cl. 123-569.000.

Carr, Edward P.: *See*—
Dotson, Ronald L.; and Carr, Edward P., 4,333,913, Cl. 423-184.000.

Carraway, John B., Jr.: *See*—
Wolcott, Duane K.; and Carraway, John B., Jr., 4,333,810, Cl. 204-195.00M.

Carrier Corporation: *See*—
Lang, Richard D.; and Bolton, Theodore S., 4,333,206, Cl. 16-335.000.

Carson, Andrew B., Jr.; and Harris, Samuel C., Jr., to General Electric Company. Driving force control system for impact printer. 4,333,398, Cl. 101-93.020.

Carter, Joel S.: *See*—
Hendrickson, Richard T.; and Carter, Joel S., 4,333,668, Cl. 280-703.000.

Carver, Joseph L. Flask. 4,334,028, Cl. 435-284.000.

Case, Dorothy S. Baby backpack sack. 4,333,591, Cl. 224-160.000.

Castaneda, Fernando: *See*—
Stockli, Andre; Castaneda, Fernando; and Stockli, Jean-Louis, 4,333,192, Cl. 12-142.00E.

Catlett, John C., to BESAM-EADS, Inc. Automatic door operator. 4,333,270, Cl. 49-336.000.

Catnic Components Limited: *See*—
Robinson, Brian, 4,333,294, Cl. 52-695.000.

Center for Design Research and Development N.V.: *See*—
Ambasz, Emilio, 4,333,683, Cl. 297-292.000.

Cernansky, Joseph S.: *See*—
Rudell, Elliot A.; Cernansky, Joseph S.; and Kamrath, Richard P., 4,333,655, Cl. 273-241.000.

Chan, James K.; May, Curtis L.; and Spooner, Allan, to Magnavox Government and Industrial Electronics Company. Adaptive image enhancement system. 4,334,244, Cl. 358-166.000.

Chang, Mike S. H.; Donoghue, John T.; and Edelman, Peter G., to Pitney Bowes Inc. Cyanine and diane dye mixture provides near I. R. sensitive, charge transport layer, electrophotographic photoconductive element. 4,334,000, Cl. 430-58.000.

Chaphalkar, Dhananjay V.: *See*—
Beiswenger, John L.; Moon, Howard R.; Chaphalkar, Dhananjay V.; and Smiesko, Frank A., 4,333,493, Cl. 137-268.000.

Charles, Magalie M.; and Heiart, Robert B., to Du Pont de Nemours, E. I., and Company. Process for modifying tacky surfaces. 4,334,009, Cl. 430-291.000.

Chauvette, Robert R., to Eli Lilly and Company. Cephalosporin intermediates. 4,334,065, Cl. 544-30.000.

Cheatham, John B., Jr.: *See*—
Daniels, William H.; and Cheatham, John B., Jr., 4,333,540, Cl. 175-329.000.

Chelminski, Bohdan: *See*—
Przyluski, Jan; Madry, Kazimierz; Dolecki, Zbigniew; Kotarski, Andrzej; Drygas, Maria; Kokosinski, Jacek; Kuzma, Zygmunt; and Chelminski, Bohdan, 4,333,802, Cl. 204-54.00R.

Chemische Werke Huls AG: *See*—
Meyer, Klaus-Rudolf; Hornung, Karl-Heinz; Feldmann, Rainer; and Smigerski, Hans-Jurgen, 4,334,056, Cl. 528-496.000.

Cheng, Julian: *See*—
Boyd, Gary D.; Cheng, Julian; and Ngo, Peter D. T., 4,333,708, Cl. 350-346.000.

Chervitz, Melvin. Fever thermometer. 4,333,477, Cl. 128-736.000.

Chevron Research: *See*—
Manning, John F., 4,334,118, Cl. 585-529.000.

Chicago Bridge & Iron Company: *See*—
Bellafiore, Francis V.; Duff, Michael P.; and O'Meara, David M., 4,333,973, Cl. 427-424.000.

Chigot, Claude R.: *See*—
Boeglin, Paul H.; and Chigot, Claude R., 4,333,381, Cl. 89-1.00B.

Chimicasa GmbH: *See*—
Sampathkumar, Prathivadibhayankaram S.; and Dwivedi, Basant K., 4,333,872, Cl. 260-112.50R.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See*—
Toke, Laszlo; Szabo, Gabor T.; Szabo, Gabor; Nagy, Lajos; and Rusznak, Istvan, 4,334,103, Cl. 568-631.000.

Chloride Electro Networks, Division of Chloride, Inc., N. American Operation: *See*—
Carey, James J., 4,333,900, Cl. 264-85.000.

Chow, Peter C. M.; and Ringer, William N., to Grove Valve and Regulator Company. Surge reliever with increase capacity flow. 4,333,496, Cl. 137-489.000.

Chow, Tat-Sing P.; and Ghezzo, Mario, to General Electric Company. Method of making integrated circuits. 4,333,965, Cl. 427-93.000.

Christensen, Jon A.: *See*—
Jones, William L.; and Christensen, Jon A., 4,333,505, Cl. 141-383.000.

Christy, R. Steven, Sr. Wood rack. 4,333,574, Cl. 211-60.00R.

Chrysler Corporation: *See*—
Brunais, Ellsworth G.; and McCombie, Jay C., 4,333,434, Cl. 123-478.000.

Chu, Wei-Kan: *See*—
Bhattacharyya, Arup; Chu, Wei-Kan; Howard, James K.; and Wiedman, Francis W., 4,333,808, Cl. 204-192.00D.

Chynoweth, David P.; and Tarman, Paul B., to Institute of Gas Technology. Hybrid bio-thermal liquefaction. 4,334,026, Cl. 435-163.000.

Cianci, James P.: *See*—
Villari, Frank K.; and Cianci, James P., 4,333,480, Cl. 128-767.000.

Ciba-Geigy Corporation: *See*—
Bartels, Hermann; Mez, Hans-Christian; Huber, Walter; and Stolz, Hans-Peter, 4,333,356, Cl. 73-864.210.
Schmid, Wolfgang, 4,333,931, Cl. 424-248.540.
Schmidt, Andreas; Kirchmayr, Rudolf; and Randell, Donald R., 4,333,841, Cl. 252-32.70E.
Schmidt, Andreas; and Schwarzenbach, Kurt, 4,333,868, Cl. 524-152.000.
Sturm, Elmar; and Nyfeler, Robert, 4,333,949, Cl. 424-300.000.

Ciccozzi, Frederick A., to Geosource Inc. Electronic valve controller. 4,333,486, Cl. 137-1.000.

Citten Limited: *See*—
Ellis, Stephen R. M.; and Priestley, Ronald, 4,333,892, Cl. 261-94.000.

Civardi, Frank P.; Sova, Stanley G.; and Getting, Milan J., to Inmont Corporation. Laminating. 4,333,786, Cl. 156-306.600.

Clancy, Robert E. Two-sided puzzle. 4,333,652, Cl. 273-153.00S.

Clarion Co., Ltd.: *See*—
Minagawa, Shoichi; and Okamoto, Takeshi, 4,334,167, Cl. 310-313.00R.

Clark, Egbert B., III, to E-Systems, Inc. Communication management system for providing antijam/privacy capabilities for voice radio communications. 4,334,322, Cl. 455-62.000.

Clavier, Christian M., to Schlumberger Technology Corporation. Well logging method and system. 4,334,271, Cl. 364-422.000.

Clegg, John E. Conical beam concentrator. 4,333,713, Cl. 350-432.000.

Clements, Lloyd W. Grooved nozzle irrigation sprinkler. 4,333,610, Cl. 239-601.000.

Cloos, Erwin, to Carl Cloos Verwaltungsgesellschaft oHG. Planet guide roller feed arrangement for melting welding wires. 4,333,594, Cl. 226-176.000.

Cluett, Peabody & Co., Inc.: *See*—
Rockerath, John L., 4,333,409, Cl. 112-121.270.

Clyde, Robert A. High area contactor. 4,333,893, Cl. 261-94.000.

Coal Industry (Patents) Limited: *See*—
Robinson, Joseph G.; and Brain, Sally A., 4,334,055, Cl. 528-229.000.

Cobb, Raymond L., to Phillips Petroleum Company. Process for making tert-butyltoluenes. 4,334,115, Cl. 585-407.000.

Coca-Cola Company, The: *See*—
Fessler, Herman S.; and Harvill, William A., 4,333,587, Cl. 222-129.100.

Cockshott, Charles P.: *See*—
Bill, Colin S.; Cockshott, Charles P.; and Francis, John H., 4,334,207, Cl. 336-136.000.

Cole, Jack H.: *See*—
Dacus, Michael W.; and Cole, Jack H., 4,333,355, Cl. 73-861.910.

Colgate-Palmolive Company: *See*—
Muller, Ernest G., 4,333,461, Cl. 128-284.000.
Colon, Ismael, to Union Carbide Corporation. Preparation of substituted olefins. 4,334,081, Cl. 560-130.000.
Colt Industries Operating Corp: *See*—
Miller, Robert J., 4,333,891, Cl. 261-41.00D.
Comar, Dominique; Loc'h, Christian; and Maziere, Bernard, to Commissariat a l'Energie Atomique. Method of preparing a solution of gallium 68 from germanium 68. 4,333,911, Cl. 423-2.000.
Combette, Marc; and Ollivier, Jean, to Olin Corporation. Offset piston for powder actuated tools. 4,333,595, Cl. 227-10.000.
Combustion Engineering, Inc.: *See*—
Anthony, Andrew J., 4,333,798, Cl. 376-449.000.
Tanca, Michael C., 4,333,742, Cl. 48-77.000.
Comhlucht Siuicre Eireann Teoranta (Irish Sugar Company Limited): *See*—
Barry, James A.; and McGarry, James, 4,333,960, Cl. 426-625.000.
Commissariat a l'Energie Atomique: *See*—
Comar, Dominique; Loc'h, Christian; and Maziere, Bernard, 4,333,911, Cl. 423-2.000.
Duchene, Jacques, 4,333,710, Cl. 350-357.000.
Compagnie Chambon: *See*—
Bougaran, Alain P., 4,333,196, Cl. 14-71.700.
Compagnie Internationale pour l'Informatique CII Honeywell Bull (Societe Anonyme): *See*—
Miller, Jacky F. A., 4,333,640, Cl. 271-9.000.
Concept Engineering Inc.: *See*—
Geschwender, Robert C., 4,333,602, Cl. 229-44.00R.
Conn, William H., to Ohline Corporation. Sectional Venetian blinds. 4,333,509, Cl. 160-173.000.
Conner, Donald E., to Van Dyk & Company, Inc. Benzalphthalides and broad spectrum sun screens. 4,333,920, Cl. 424-59.000.
Connery, James G.; Diascro, Dominick D.; DiNapoli, Louis D.; Punis, Giancarlo; and Matour, Anthony J., to Leeds & Northrup Company. Injection-molded Doppler flowmeter transducer assembly. 4,333,352, Cl. 73-861.180.
Conoco Inc.: *See*—
Beck, Jeffrey L.; and Sweeney, William T., 4,333,499, Cl. 137-812.000.
McClaflin, Gifford G., 4,333,488, Cl. 137-13.000.
Peterson, Marvin L., 4,333,725, Cl. 403-271.000.
Conroy, Richard F. M.: *See*—
Jones, Lawrence T.; Sims, Anson; Howden, Ashley G.; Knighton, Mark S.; Kingsbury, L. C. James; and Conroy, Richard F. M., 4,333,261, Cl. 46-257.000.
Container Corporation of America: *See*—
Gardner, Jeffrey M., 4,333,600, Cl. 229-42.000.
Continental Group, Inc., The: *See*—
Stemen, Michael J., 4,333,599, Cl. 229-5.700.
Coombs, Donald W. Beveled edge trim. 4,333,288, Cl. 52-312.000.
Cooper, Andrew K. Display sign. 4,333,253, Cl. 40-10.00R.
Cooper, George. Plant spreader device for a crop harvester. 4,333,305, Cl. 56-327.00R.
Cooper, Steven R.; and Shaw, Kenneth L., to CTS Corporation. Multistage pressure switch. 4,334,131, Cl. 200-82.00R.
Cooper, Thomas W., to Dresser Industries, Inc. Rotary rock bit with improved thrust flange. 4,333,691, Cl. 308-8.200.
Cooper Tire & Rubber Company: *See*—
Klose, Karl W., 4,333,788, Cl. 156-405.00R.
Corbin, Raymond L. R.; and Reinhart, Robert F., to Manville Service Corporation. Three-tab shingle with staggered butt edge feature. 4,333,279, Cl. 52-105.000.
Cornelius Company, The: *See*—
Fessler, Herman S.; and Harvill, William A., 4,333,587, Cl. 222-129.100.
Corning Glass Works: *See*—
Cunningham, George M., 4,333,896, Cl. 264-40.500.
Domicone, Joseph J., 4,333,467, Cl. 128-303.140.
Frost, Rodney I.; McBrayer, Robert D.; and Pujari, Vimal K., 4,333,518, Cl. 165-8.000.
Lemrow, Craig M.; and Wilder, Arthur H., 4,333,447, Cl. 126-443.000.
Cornish, William D.; and Gauthier, Francois A., to Canada, Her Majesty the Queen in right of, as represented by Minister of National Defence of Her Majesty's Canadian Government. Broadband frequency divider. 4,334,202, Cl. 333-218.000.
Coronel, Paul D. Steam assisted gas turbine engine. 4,333,309, Cl. 60-39.09D.
Corriero, John. Protective structures for joints. 4,333,181, Cl. 2-24.000.
Coste, Angelo C., to UOP Inc. Separation of normally gaseous hydrocarbons from a catalytic reforming effluent and recovery of purified hydrogen. 4,333,818, Cl. 208-101.000.
CP Test Services - Valvco, Inc.: *See*—
Shope, Thomas, 4,333,494, Cl. 137-364.000.
Craig, Robert S., to Acme Resin Corporation. Catechol resins for the shell process. 4,333,513, Cl. 164-526.000.
Creuzet, Marie-Helene; Feniou, Claude; Guichard, Francoise; and Prat, Gisele, to Laboratoires Sarget. Orthoarylideneaminophenethylamines and pharmaceutical compositions. 4,333,930, Cl. 424-248.510.
Creuzet, Marie-Helene; Feniou, Claude; Prat, Gisele; and Pontagnier, Henri, to Laboratoires Sarget. Imino derivatives of 5-aminobenzodioxole-1,3 which are useful as medicaments. 4,333,938, Cl. 424-263.000.
Crico, Aurelio M., to PPG Industries, Inc. Purification and recovery of ethylene dichloride. 4,333,799, Cl. 203-67.000.
Crofts, John A.: *See*—
Mills, Alfred L.; Weatherley, Laurence R.; and Crofts, John A., 4,333,912, Cl. 423-20.000.
Crosfield Electronics Limited: *See*—
Franklin, Paul E., 4,334,240, Cl. 358-78.000.
Crowe, William D.: *See*—
Cardoza, Richard E.; and Crowe, William D., 4,333,839, Cl. 210-777.000.
Crump, John M. Device for carrying and securing skis, boots and poles. 4,333,677, Cl. 294-147.000.
CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See*—
Girardi, Gerardo, 4,334,305, Cl. 370-86.000.
CTS Corporation: *See*—
Cooper, Steven R.; and Shaw, Kenneth L., 4,334,131, Cl. 200-82.00R.
Cullen, Donald E.: *See*—
Gilden, Meyer; Cullen, Donald E.; and Grudkowski, Thomas W., 4,333,342, Cl. 73-516.00R.
Culver, W. Jay. Gun sighting apparatus. 4,333,385, Cl. 89-37.0BA.
Cummins, Charles A., II, to AFT Inc. Automatic engine shut down device and systems employing the same. 4,333,827, Cl. 210-100.000.
Cummins, James P.: *See*—
Parman, Dan F.; Wiebush, LeMoey M.; Shaw, Fred M.; and Cummins, James P., 4,334,171, Cl. 315-199.000.
Cunningham, George M., to Corning Glass Works. Method and apparatus for extruding honeycomb structures with skins thereon involving the use of an adjustable extension die mask. 4,333,896, Cl. 264-40.500.
Cupit, George M. Seal device for pipe projecting through roof. 4,333,660, Cl. 277-9.000.
Curran, William V., to American Cyanamid Company. Cephalosporanic acid derivatives. 4,334,062, Cl. 544-026.000.
Cushing, Donald S., to General Electric Company. Heater protection arrangement for a washing appliance. 4,334,143, Cl. 219-333.000.
Cvengros, Jan: *See*—
Tkac, Alexander; and Cvengros, Jan, 4,333,822, Cl. 208-184.000.
Cyloflex, Inc.: *See*—
Lovas, Joseph R.; Lovas, Paul J.; and Koelmel, Carl F., 4,333,236, Cl. 30-380.000.
Czuszak, Charles C., to Elliott Turbomachinery Co., Inc. Centrifugally actuated trip mechanism. 4,333,343, Cl. 73-538.000.
Dacus, Michael W.; and Cole, Jack H., to United States of America, Energy. Pressure balanced drag turbine mass flow meter. 4,333,355, Cl. 73-861.910.
Dagani, Michael J., to Ethyl Corporation. Process for producing substituted pyrroles. 4,333,878, Cl. 548-531.000.
Dai, Shenghong A., to Upjohn Company, The. Process for the preparation of hydroxyphenyl-indanols. 4,334,106, Cl. 568-719.000.
Daisen Industry Company Limited: *See*—
Hayashi, Tatsuo; Itoh, Ryouichi; and Tsuji, Tatsumi, 4,333,897, Cl. 264-40.600.
Dakin, John P.; and Kahn, David A., to Plessey Incorporated. Position indicating systems. 4,334,152, Cl. 250-226.000.
Dana Corporation: *See*—
Sink, William H.; and Lane, Wendell, 4,333,554, Cl. 192-70.190.
Dane, Richard, II: *See*—
Burillo, Antonio; and Dane, Richard, II, 4,333,427, Cl. 123-190.00A.
Daniel, Sam M.; and Kuivila, Richard P., to Motorola Inc. Adaptive fixed point arithmetic controller apparatus and method. 4,334,283, Cl. 364-744.000.
Daniels, Herbert E.: *See*—
Stehman, Harold E.; and Daniels, Herbert E., 4,334,153, Cl. 250-405.000.
Daniels, William H.; and Cheatham, John B., Jr., to General Electric Company. Cutter element and cutter for rock drilling. 4,333,540, Cl. 175-329.000.
Danke, Eckhard: *See*—
Hoppe, Klaus; Muller, Jurgen; Keller, Jurgen; Kulbe, Bernd; Lessig, Klaus; Berlin, Christian; and Danke, Eckhard, 4,333,894, Cl. 261-96.000.
Dassele, Michael A.: *See*—
Kelley, Michael R.; Emfinger, Jack E.; and Dassele, Michael A., 4,334,222, Cl. 340-870.290.
Davidge, Ronald V.; Queener, Carl A.; and Vanderslice, James T., to International Business Machines Corporation. Recirculating document feed for electrophotographic apparatus. 4,333,639, Cl. 271-3.100.
Davidson, Craig R.; and Sedlak, John M., to General Electric Company. Halogen evolution with improved anode catalyst. 4,333,805, Cl. 204-98.000.
Davis, Frances P. Candy-covered figurine and method of producing. 4,333,974, Cl. 428-16.000.
Davis, James W.: *See*—
Longley, Karl E.; Ratigan, Brian; and Davis, James W., 4,333,833, Cl. 210-198.100.
Davis, Lawrence E.; and Patel, Naren I., to Siecor Corporation. Filling materials for communications cable. 4,333,706, Cl. 350-96.230.
Davis, Meredith R., to Otis Elevator Company. Car blocking apparatus. 4,333,549, Cl. 187-93.000.
Davis, Ralph A.; and Pews, R. Garth, to Dow Chemical Company, The. Process for preparing substituted benzotrihalides. 4,334,111, Cl. 570-143.000.
Davis, Sydney; and Malakhoff, Alexander, to United States of America, Navy. Transversely stiffened membrane seal. 4,333,413, Cl. 114-67.00A.

Daxinger, Helmut: *See*—
Pulker, Hans K.; and Daxinger, Helmut, 4,333,962, Cl. 427-37.000.

Dayco Corporation: *See*—
Kleykamp, Donald L., 4,333,404, Cl. 105-225.000.

de la Burde, Roger Z.; Aument, Patrick E.; and Utsch, Francis V., to Philip Morris Incorporated. Tobacco product. 4,333,483, Cl. 131-352.000.

DEC International, Inc.: *See*—
Schluckbier, Gary W., 4,333,421, Cl. 119-14.080.

Decker, Harry J.; and Thorsteinson, Erlind M., to Union Carbide Corporation. Catalyst with Mo, V, Ti and process. 4,333,858, Cl. 252-455.00R.

Decker, Wilmot H.; and Theurer, Kurt, to Allied Corporation. Removing liquid hydrocarbons from polyether solvents. 4,334,102, Cl. 568-621.000.

Deere & Company: *See*—
Hentrich, Robert D., Sr., 4,333,535, Cl. 172-572.000.

Deffeyes, Robert J.; and Armstrong, Harris W., to Graham Magnetics, Inc. Method of forming a conductive metal pattern. 4,333,966, Cl. 427-96.000.

De Jong, Donald W., to International Harvester Company. Coagulation method for preparing leaf protein concentrates (LPC) from plant foliage. 4,333,871, Cl. 260-112.00R.

Del Bon, Luigi. Deep-drawn preformed closure for the hermetic sealing of a can or similar container. 4,333,585, Cl. 220-359.000.

Delmas, Robert: *See*—
Moisset, Jacques; Bonet, Claude; Rouanet, Alain; Petit, Alain; and Delmas, Robert, 4,333,766, Cl. 106-100.000.

Del Rosario, Manuel. Toothbrush. 4,333,199, Cl. 15-167.00R.

De Luca, Paul V.; Gazzo, John J.; and Hollfelder, Thomas A., to Porta Systems Corp. Telephone digital office cutover system. 4,334,129, Cl. 179-175.110.

Dembinski, Walter; and Kuhne, Karl-Joachim, to Fichtel & Sachs AG. Arrangement for moving an object. 4,333,627, Cl. 248-396.000.

Dennis, Philip J., to GTE Products Corporation. Glass enclosed three lead circuit breaker. 4,334,209, Cl. 337-112.000.

DePaolo, James F.; Hale, Joseph T.; and Holmberg, Carl F., to Nichols-Homeshield, Inc. Hurricane panel security device. 4,333,271, Cl. 49-464.000.

DeSantis, Charles M., to United States of America, Army. Phase sensor for R.F. transmission lines. 4,334,187, Cl. 324-58.00R.

Deubel, Reinhold; Opitz, Konrad; Kruse, Hubert; Schneider, Manfred; and Uhrig, Heinz, to Hoechst Aktiengesellschaft. Dyestuff preparations containing oxalkylates of modified natural rosin acids. 4,333,732, Cl. 8-527.000.

Diascro, Dominick D.: *See*—
Connery, James G.; Diascro, Dominick D.; DiNapoli, Louis D.; Punis, Giancarlo; and Matour, Anthony J., 4,333,352, Cl. 73-861.180.

Diehr, Hans-Joachim, to Bayer Aktiengesellschaft. Process for the preparation of alpha-hydroxycarboxylic acid amide compounds. 4,334,073, Cl. 546-245.000.

Diekmann, Helmut: *See*—
Dorr, Karl H.; Diekmann, Helmut; Grimm, Hugo; Sander, Ulrich; Tacke, Michael; and Weber, Waldemar, 4,333,917, Cl. 423-522.000.

Diemi, Werner: *See*—
Bloeck, Siegfried; Hofling, Erich; Luthi, Rudolf; and Diemi, Werner, 4,333,582, Cl. 220-66.000.

Diesel Kiki Company, Ltd.: *See*—
Kobayashi, Masayoshi; Sakuranaka, Toru; and Nakagawa, Sachio, 4,333,432, Cl. 123-366.000.

Dietrich, Hagen; and Fane, William J., to Norris Industries, Inc. Spring/dead bolt lock assembly. 4,333,324, Cl. 70-107.000.

Dika, John A.: *See*—
Juengst, Fred W., Jr.; and Dika, John A., 4,333,956, Cl. 426-69.000.

Dill, James M.: *See*—
Cardone, Joseph T.; Shatz, Kenneth J.; and Dill, James M., 4,333,313, Cl. 60-649.000.

Di Martini, Carl R.; Scott, William L.; and Bulvanoski, Leo J., to Asarco Incorporated. Low temperature, non-SO_2 polluting, kettle process for the separation of antimony values from material containing sulfo-antimony compounds of copper. 4,333,762, Cl. 75-69.000.

Di Martini, Carl R.; Howe, Herbert E.; Scott, William L.; and Bulvanoski, Leo J., to Asarco Incorporated. Low temperature, non-SO_2 polluting, kettle process for separation of lead from lead sulfide-containing material. 4,333,763, Cl. 75-77.000.

DiNapoli, Louis D.: *See*—
Connery, James G.; Diascro, Dominick D.; DiNapoli, Louis D.; Punis, Giancarlo; and Matour, Anthony J., 4,333,352, Cl. 73-861.180.

Di Nunzio, Giuseppe. Bottle cap having opening means. 4,333,578, Cl. 215-253.000.

Dionian, James A.: *See*—
Seeman, Jeffrey L.; and Dionian, James A., 4,334,258, Cl. 361-170.000.

DiRocco, David J.: *See*—
DiRocco, Jobbie; and DiRocco, David J., 4,333,508, Cl. 152-367.000.

DiRocco, Jobbie; and DiRocco, David J. Tire repair patch for sidewall and bead repairs. 4,333,508, Cl. 152-367.000.

Dischert, Robert A.: *See*—
Reitmeier, Glenn A.; and Dischert, Robert A., 4,334,237, Cl. 358-36.000.

Disko, Harry: *See*—
Jaworski, Eugene; Disko, Harry; and Breslow, Jeffrey D., 4,333,657, Cl. 273-376.000.

Dodson, Peter J.; and Horwood, Kenneth E., to Guardall Limited. Machines and method applicable to the manufacture of electrical and like devices. 4,333,233, Cl. 29-845.000.

Dolecki, Zbigniew: *See*—
Przyluski, Jan; Madry, Kazimierz; Dolecki, Zbigniew; Kotarski, Andrzej; Drygas, Maria; Kokosinski, Jacek; Kuzma, Zygmunt; and Chelminski, Bohdan, 4,333,802, Cl. 204-54.00R.

Dollinger Corporation: *See*—
Flood, Lawrence C., 4,333,579, Cl. 220-4.00R.

Dollond & Aitchison Services Limited: *See*—
Eadon-Allen, Stuart, 4,333,274, Cl. 51-160.000.

Domicone, Joseph J., to Corning Glass Works. Nonstick conductive coating. 4,333,467, Cl. 128-303.140.

Domzalski, Thad: *See*—
Luedicke, Oscar B.; Domzalski, Thad; and Zajac, David, 4,333,921, Cl. 424-70.000.

Donaldson, Peter A., to Imperial Chemical Industries Limited. Slurries of terephthalic acid in ethylene glycol. 4,334,090, Cl. 562-480.000.

DoNel Corporation: *See*—
Meadows, David F., 4,333,284, Cl. 52-222.000.

Donoghue, John T.: *See*—
Chang, Mike S. H.; Donoghue, John T.; and Edelman, Peter G., 4,334,000, Cl. 430-58.000.

Donovan, William F.: *See*—
Stansbury, LeRoy, Jr.; and Donovan, William F., 4,333,383, Cl. 89-7.000.

Dooley, Larry W.: *See*—
Drees, Jan M.; Dooley, Larry W.; and Neathery, William D., 4,333,728, Cl. 416-134.00A.

Dorling, Rolf; and Hemschemeier, Hans, to L. & C. Steinmuller GmbH. Suspension for a thermally heavy load cylindrical pipe assembly. 4,333,514, Cl. 165-1.000.

Dorr, Karl H.; Diekmann, Helmut; Grimm, Hugo; Sander, Ulrich; Tacke, Michael; and Weber, Waldemar, to Metallgesellschaft Aktiengesellschaft. Process of producing sulfuric acid. 4,333,917, Cl. 423-522.000.

Dotson, Ronald L.; and Carr, Edward P., to Olin Corporation. Method of purifying aqueous solutions of metal hydroxides. 4,333,913, Cl. 423-184.000.

Doty, John G. Bumper mounted soil sampling device. 4,333,541, Cl. 175-162.000.

Dow Chemical Company, The: *See*—
Allada, Sambasiva R., 4,333,780, Cl. 156-78.000.
Baratz, Brenda S.; Phillips, Robert A.; and Steward, David L., 4,333,941, Cl. 424-267.000.
Davis, Ralph A.; and Pews, R. Garth, 4,334,111, Cl. 570-143.000.
Lee, John M.; and Bauman, William C., 4,333,846, Cl. 252-184.000.
Peterson, Russell R., 4,334,074, Cl. 546-327.000.
Wing, Phillip L.; and Sweeney, George A., 4,333,843, Cl. 252-75.000.
Wolcott, Duane K.; and Carraway, John B., Jr., 4,333,810, Cl. 204-195.00M.

Downing, Robert L.: *See*—
Musgrave, Dwight S.; McMahan, John D.; and Downing, Robert L., 4,333,291, Cl. 52-404.000.

Downing, Willis G., Jr. Comprehensive pulmonary measurement technique. 4,333,476, Cl. 128-720.000.

Doyle, Paul M.: *See*—
Patey, Daniel F.; and Doyle, Paul M., 4,333,338, Cl. 73-119.00A.

Drees, Jan M.; Dooley, Larry W.; and Neathery, William D., to Textron, Inc. Compound hub spring system for helicopters. 4,333,728, Cl. 416-134.00A.

Drehman, Lewis E.: *See*—
Gardner, Lloyd E.; Farha, Floyd E., Jr.; Eastman, Alan D.; and Drehman, Lewis E., 4,333,855, Cl. 252-439.000.

Dresser Industries, Inc.: *See*—
Cooper, Thomas W., 4,333,691, Cl. 308-8.200.

Dreyer, Charles W., to Sealectro Corporation. Adapter for a coaxial connector. 4,333,697, Cl. 339-31.00R.

Dria, Dennis E.: *See*—
Milberger, Ernest C.; Bremer, Noel J.; and Dria, Dennis E., 4,333,853, Cl. 252-435.000.

Drozd, Otto, to Wollard Aircraft Equipment, Inc. Aircraft loader with revolving cab. 4,333,194, Cl. 14-71.500.

Drygas, Maria: *See*—
Przyluski, Jan; Madry, Kazimierz; Dolecki, Zbigniew; Kotarski, Andrzej; Drygas, Maria; Kokosinski, Jacek; Kuzma, Zygmunt; and Chelminski, Bohdan, 4,333,802, Cl. 204-54.00R.

Dubois, Jacques E.; Pham, Minh-Chau; and Lacaze, Pierre C., to Agence Nationale de Valorisation de la Recherche (ANVAR). Films of polyphenylene oxides. 4,334,054, Cl. 528-210.000.

Dubois, Jean-Claude; Zann, Annie; Billard, Jean; and Hareng, Michel, to Thomson-CSF. Mixture of disc-like liquid crystals, electro-optical device using such a mixture and process for orienting the molecules of the mixture. 4,333,709, Cl. 350-350.00R.

Duchene, Jacques, to Commissariat a l'Energie Atomique. Electrode system for electrolytic display means with seven segments. 4,333,710, Cl. 350-357.000.

Dudley, Carl K., to Eltra Corporation. Voltage detector using an oscillator and comparator means. 4,334,188, Cl. 324-133.000.

Duff, Michael P.: *See*—
Bellafiore, Francis V.; Duff, Michael P.; and O'Meara, David M., 4,333,973, Cl. 427-424.000.

Duggleby, Peter M.; Foster, Francis G.; and Nooi, Jacobus R., to Lever Brothers Company. Detergent compositions. 4,333,844, Cl. 252-97.000.

Duke, Max E. Anchoring means for refractive blocks. 4,333,406, Cl. 110-340.000.

Dukeshire, Robert E.: *See*—
Young, Gerald T.; Easterling, Michael R.; and Dukeshire, Robert E., 4,333,901, Cl. 264-85.000.

Dumbeck, Robert F. Energy saving electrically actuated barrier gate control means operable from solar energy. 4,333,268, Cl. 49-34.000.

Dumont, Claude: *See*—
Guillaume, Jacques; Nedelec, Lucien; and Dumont, Claude, 4,333,939, Cl. 424-263.000.

Du Pont de Nemours, E. I., and Company: *See*—
Charles, Magalie M.; and Heiart, Robert B., 4,334,009, Cl. 430-291.000.
Resnick, Paul R., 4,334,082, Cl. 560-180.000.
Strolle, Clifford H., 4,334,075, Cl. 548-239.000.
Zimmerman, William T., 4,333,760, Cl. 71-92.000.

Dupre, Carl R., to Monsanto Company. Process for preparing polymeric polyblends having a rubber phase as particles with a bimodal particle size distribution. 4,334,039, Cl. 525-263.000.

Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., to Smith Kline & French Laboratories Limited. Blocking histamine H_2-receptors with imidazolylalkyl guanidine derivatives. 4,333,946, Cl. 424-273.00R.

Durbin, John A.: *See*—
Green, Frederick A.; Simpson, George R.; Avery, Stephen T.; and Durbin, John A., 4,333,723, Cl. 355-71.000.

Durkin, Gary M.: *See*—
Elkins, Robert H.; Durkin, Gary M.; and Macriss, Robert A., 4,333,524, Cl. 165-104.160.

Dwivedi, Basant K.: *See*—
Sampathkumar, Prathivadibhayankaram S.; and Dwivedi, Basant K., 4,333,872, Cl. 260-112.50R.

Dzus Fastener Co., Inc.: *See*—
Gunther, Conrad J., 4,333,211, Cl. 24-221.00R.

E.G.O. Elektro-Gerate Blanc und Fischer: *See*—
Eckert, Roland, 4,333,669, Cl. 285-21.000.

E-Systems, Inc.: *See*—
Clark, Egbert B., III, 4,334,322, Cl. 455-62.000.

Eadon-Allen, Stuart, to Dollond & Aitchison Services Limited. Machine for smoothing and/or polishing lens faces. 4,333,274, Cl. 51-160.000.

Earnshaw, Roy R.: *See*—
Nield, Barry J.; and Earnshaw, Roy R., 4,334,217, Cl. 340-685.000.

Easterling, Michael R.: *See*—
Young, Gerald T.; Easterling, Michael R.; and Dukeshire, Robert E., 4,333,901, Cl. 264-85.000.

Eastman, Alan D.: *See*—
Gardner, Lloyd E.; Farha, Floyd E., Jr.; Eastman, Alan D.; and Drehman, Lewis E., 4,333,855, Cl. 252-439.000.

Eastman Kodak Company: *See*—
Adin, Anthony; and Fleming, James C., 4,334,005, Cl. 430-211.000.
Lau, Philip T. S., 4,333,999, Cl. 430-17.000.
Lee, James K., 4,333,722, Cl. 354-234.000.
Leszyk, Gerald M., 4,333,998, Cl. 430-12.000.
Mignot, Andre G. E., 4,334,012, Cl. 430-567.000.
Sanford, Karl J.; and Eikenberry, Jon N., 4,333,733, Cl. 23-230.00B.

Eastman, Stephen B. Expandable window device. 4,333,272, Cl. 49-505.000.

Eaton Corporation: *See*—
Hoppie, Lyle O.; and Speranza, Donald, 4,333,553, Cl. 192-4.00A.

Ebata, Hiroyuki, to Yoshida Kogyo K.K. Double sash structure. 4,333,283, Cl. 52-202.000.

Eberhard, Hans J.: *See*—
Pietzsch, Ludwig; Overlach, Knut; and Eberhard, Hans J., 4,333,543, Cl. 177-134.000.

Eberhard, Patrick; and Mindt, Wolfgang, to Hoffmann-La Roche Inc. Apparatus for the cutaneous determination of the oxygen partial pressure in blood. 4,333,473, Cl. 128-635.000.

Ebert, Michael: *See*—
Reick, Franklin G., 4,333,840, Cl. 252-16.000.

Eckert, Roland, to E.G.O. Elektro-Gerate Blanc und Fischer. Brazed or soldered joints. 4,333,669, Cl. 285-21.000.

Ecological Energy Systems, Inc.: *See*—
Cardone, Joseph T.; Shatz, Kenneth J.; and Dill, James M., 4,333,313, Cl. 60-649.000.

Edelman, Peter G.: *See*—
Chang, Mike S. H.; Donoghue, John T.; and Edelman, Peter G., 4,334,000, Cl. 430-58.000.

Edelman, Seymour. Opto-acoustic transducer and telephone receiver. 4,334,321, Cl. 455-614.000.

Eder, Ulrich: *See*—
Neef, Gunter; Eder, Ulrich; Haffer, Gregor; Sauer, Gerhard; Wiechert, Rudolf; and Steinbeck, Hermann, 4,333,928, Cl. 424-243.000.

Edwards, James M., to Management Assistance Inc. Discharge/ground button. 4,334,259, Cl. 361-212.000.

Egnell, Eric R., to Nedre Norrlands Producentforening ek. for, Bangardsgatan. Method for the manufacture of whey products. 4,333,958, Cl. 426-583.000.

Eguchi, Kouichi; and Inoie, Tsuguya, to Japan Radio Company, Limited. Antenna system for satellite communication. 4,334,226, Cl. 343-100.0ST.

Eheim, Franz, to Robert Bosch GmbH. Apparatus for controlling recirculated exhaust gas quantities in self-igniting internal combustion engines. 4,333,440, Cl. 123-569.000.

Eikenberry, Jon N.: *See*—
Sanford, Karl J.; and Eikenberry, Jon N., 4,333,733, Cl. 23-230.00B.

Eistetter, Klaus; Kley, Hans-Peter; Menge, Heinz-Gunter; and Schaefer, Hartmann, to BYK Gulden Lomberg Chemische Fabrik GmbH. Anti-depressant and analgesic 4-phenoxypiperidines. 4,333,942, Cl. 424-267.000.

Ekdahl, Per A. A.; and Moller, Fred L., to Telefonaktiebolaget L M Ericsson. Overvoltage protection device. 4,334,257, Cl. 361-119.000.

Ekwall, Carl G. B., to Atlas Copco Aktiebolag. Pneumatic drill lubricator. 4,333,538, Cl. 173-104.000.

El Paso Polyolefins Company: *See*—
Zukowski, Edward A., 4,334,041, Cl. 525-53.000.

Elbetti, Meri: *See*—
Maselli, Maria; Frullini, Alberto; Elbetti, Meri; and Frullini, Luisa, 4,333,408, Cl. 112-121.150.

Electrolux GmbH: *See*—
Michael, Harald, 4,333,830, Cl. 210-170.000.

Elettrochimica Marco Ginatta S.p.A.: *See*—
Ginatta, Marco, 4,333,219, Cl. 29-403.300.

Eli Lilly and Company: *See*—
Baltz, Richard H.; Wild, Gene M.; and Seno, Eugene T., 4,334,019, Cl. 435-76.000.
Beck, James R.; and Yahner, Joseph A., 4,333,923, Cl. 424-115.000.
Chauvette, Robert R., 4,334,065, Cl. 544-30.000.
Greene, James M.; and Bunnell, Charles A., 4,334,079, Cl. 560-75.000.
Kleber, John W.; and Simpson, Barbara E., 4,333,919, Cl. 424-15.000.
Shuman, Robert T., 4,333,873, Cl. 260-112.50E.
Spry, Douglas O., 4,334,063, Cl. 544-28.000.
Spry, Douglas O., 4,334,064, Cl. 544-30.000.

Elkins, Robert H.; Durkin, Gary M.; and Macriss, Robert A., to Southern California Gas Company. High efficiency furnace. 4,333,524, Cl. 165-104.160.

Ellenberger, Michael L., to Memorex Corporation. Method of manufacturing thin film magnetic head/slider combination. 4,333,229, Cl. 29-603.000.

Elliott, George; and Ely, Brian W., to Marconi Company Limited, The. Process for the preparation of metal diphthalocyanines. 4,333,876, Cl. 260-245.730.

Elliott Turbomachinery Co., Inc.: *See*—
Czuszak, Charles C., 4,333,343, Cl. 73-538.000.

Ellis, John F. G., to British Petroleum Company Limited, The. Production of aromatic hydrocarbons from a mixed feedstock of C_5–C_{12} olefins and C_3–C_4 hydrocarbons. 4,334,114, Cl. 585-407.000.

Ellis, Stephen R. M.; and Priestley, Ronald, to Citten Limited. Dumped packings and apparatus comprising such dumped packings. 4,333,892, Cl. 261-94.000.

Elmeskog, Alf U. Device for measurement of muscular strength. 4,333,340, Cl. 73-379.000.

Eltra Corporation: *See*—
Dudley, Carl K., 4,334,188, Cl. 324-133.000.
Mattson, Richard W., 4,333,433, Cl. 123-420.000.

Ely, Brian W.: *See*—
Elliott, George; and Ely, Brian W., 4,333,876, Cl. 260-245.730.

Emfinger, Jack E.: *See*—
Kelley, Michael R.; Emfinger, Jack E.; and Dassele, Michael A., 4,334,222, Cl. 340-870.290.

Emmons, William D.; Winey, Donald A.; and Rounds, Nicholas A., to Rohm and Haas Company. Radiation curable compositions containing β-cyanoethoxyalkyl acrylates. 4,333,963, Cl. 427-44.000.

Encor Limited: *See*—
Hurtig, Carl R., 4,333,366, Cl. 81-170.000.

Engel, John F., to FMC Corporation. (+)-4-Substituted-2-indanol insecticidal ester derivatives. 4,333,950, Cl. 424-305.000.

Engelke, Helmut: *See*—
Bohlen, Harald; Engelke, Helmut; Kulcke, Werner; Nehmiz, Peter; and Greschner, Johann, 4,334,156, Cl. 250-491.000.

Enomoto, Hiroshi: *See*—
Matsumura, Shingo; Enomoto, Hiroshi; Aoyagi, Yoshiaki; and Shibata, Yoshihisa, 4,333,933, Cl. 424-249.000.

Enter, William L., Sr. Apparatus and method for controlling a watering system. 4,333,490, Cl. 137-78.300.

Epps, Jerre E.: *See*—
Weldin, Karl D., 4,333,568, Cl. 206-387.000.

Erickson, David E., to General Tire & Rubber Company, The. Adhesion of brass to rubber. 4,333,785, Cl. 156-281.000.

Erickson, David E., to General Tire & Rubber Company, The. Adhesion of rubber to brass. 4,333,787, Cl. 156-307.300.

Erickson, John W., to Baker International Corporation. Rotary gas/liquid separator. 4,333,748, Cl. 55-202.000.

Erpenbach, Heinz: *See*—
Kubbeler, Hans-Klaus; Erpenbach, Heinz; Gehrmann, Klaus; and Schmitz, Klaus, 4,333,884, Cl. 260-546.000.

Etat Francais: *See*—
Besson, Raymond J.; and Valentin, Jean P., 4,334,168, Cl. 310-343.000.

Ethyl Corporation: *See*—
Bossier, Joseph A., III, 4,334,061, Cl. 536-119.000.
Dagani, Michael J., 4,333,878, Cl. 548-531.000.

Etoh, Yukihiro: *See*—
Tanaka, Toshiaki; and Etoh, Yukihiro, 4,333,428, Cl. 123-198.00F.

Eutectic Corporation: *See*—
Rotolico, Anthony J.; and Romero, Eduardo, 4,333,416, Cl. 118-47.000.
Evans, Terence A. Roller bearing. 4,333,695, Cl. 308-211.000.
Ex-Cell-O Corporation: *See*—
Hendry, James W., 4,333,608, Cl. 239-118.000.
Excelermatic Inc.: *See*—
Kraus, Charles E., 4,333,692, Cl. 308-9.000.
Explosive Fabricators: *See*—
Hardwick, Roy, 4,333,597, Cl. 228-108.000.
Extracorporeal Medical Specialties, Inc.: *See*—
Porter, Christopher H.; and Taylor, John A., 4,333,906, Cl. 264-40.300.
Exxon Research and Engineering Company: *See*—
Baker, Richard H.; and Baumgarten, Arthur A., Jr., 4,334,254, Cl. 361-9.000.
Hardy, James E.; and Knarr, John J., 4,333,735, Cl. 23-232.00R.
Facemate Corporation: *See*—
Russell, William M., 4,333,980, Cl. 428-192.000.
Fag Kugelfischer Georg Schafer & Co.: *See*—
Schleyer, Herbert; and Bieber, Theo, 4,333,308, Cl. 57-339.000.
Fahner, Theodorus A.: *See*—
Wittekoek, Stefan; and Fahner, Theodorus A., 4,334,139, Cl. 219-121.0EW.
Fairchild Camera and Instrument Corp.: *See*—
Ferris, David A., 4,334,157, Cl. 307-291.000.
Falleroni, Charlene A.: *See*—
Neely, James E., Jr.; Lin, Chia-Cheng; Falleroni, Charlene A.; and Moff, Annette, 4,333,914, Cl. 423-314.000.
Fane, William J.: *See*—
Dietrich, Hagen; and Fane, William J., 4,333,324, Cl. 70-107.000.
Farber, Sheldon: *See*—
Becker, William J.; Farber, Sheldon; and Hoover, Troy E., 4,334,072, Cl. 546-112.000.
Farha, Floyd E., Jr.: *See*—
Gardner, Lloyd E.; Farha, Floyd E., Jr.; Eastman, Alan D.; and Drehman, Lewis E., 4,333,855, Cl. 252-439.000.
Faris, Sadeg M., to International Business Machines Corporation. Superconducting switch and amplifier device. 4,334,158, Cl. 307-462.000.
Farmos-Yhtyma Oy: *See*—
Karjalainen, Arto J.; and Kurkela, Kauko O. A., 4,333,947, Cl. 424-273.00R.
Faryna, Myron; and Morphet, Kerry A., to General Motors Corporation. Carburetor vacuum break assembly. 4,333,889, Cl. 261-39.00B.
Federal-Mogul Corporation: *See*—
Arnswald, Jeffrey K., 4,333,685, Cl. 299-39.000.
Arnswald, Jeffrey K., 4,333,686, Cl. 299-39.000.
Federal Signal Corporation: *See*—
McConnell, Michael V.; and Graham, Paul D., 4,334,211, Cl. 340-88.000.
Feitler, David, to Air Products and Chemicals, Inc. Method for producing carboxylic acid anhydride. 4,333,885, Cl. 260-549.000.
Feldmann, Rainer: *See*—
Meyer, Klaus-Rudolf; Hornung, Karl-Heinz; Feldmann, Rainer; and Smigerski, Hans-Jurgen, 4,334,056, Cl. 528-496.000.
Felfoldy, Lajos: *See*—
Plosz, Sandor; Babos, Katalin; Rozsavolgyi, Karoly; and Felfoldy, Lajos, 4,333,837, Cl. 210-602.000.
Feller, Murray F., to Wilgood Corporation. Liquid flow sensors. 4,333,354, Cl. 73-861.770.
Feniou, Claude: *See*—
Creuzet, Marie-Helene; Feniou, Claude; Guichard, Francoise; and Prat, Gisele, 4,333,930, Cl. 424-248.510.
Creuzet, Marie-Helene; Feniou, Claude; Prat, Gisele; and Pontagnier, Henri, 4,333,938, Cl. 424-263.000.
Ferag AG: *See*—
Reist, Walter, 4,333,559, Cl. 198-461.000.
Fergin, Richard L.: *See*—
Neuzil, Richard W.; and Fergin, Richard L., 4,333,770, Cl. 127-46.300.
Ferrarini, Ezio. Corona effect surface treatment apparatus for sheet. 4,334,144, Cl. 219-383.000.
Ferris, David A., to Fairchild Camera and Instrument Corp. Data latch with enable signal gating. 4,334,157, Cl. 307-291.000.
Fessler, Herman S.; and Harvill, William A., to Coca-Cola Company, The; and Cornelius Company, The, part interest to each. Beverage dispenser. 4,333,587, Cl. 222-129.100.
Fey, Robert M.: *See*—
Billings, David L.; Fey, Robert M.; and Waugh, Richard A., 4,333,322, Cl. 68-23.200.
Fiat-Allis Macchine Movimento Terra S.p.A.: *See*—
Grattapaglia, Giorgio P., 4,333,358, Cl. 74-359.000.
Fichtel & Sachs AG: *See*—
Dembinski, Walter; and Kuhne, Karl-Joachim, 4,333,627, Cl. 248-396.000.
Filtrol Corporation: *See*—
Lim, John; Brady, Michael; and Stamires, Dennis, 4,333,857, Cl. 252-455.00Z.
Firey, Joseph C. Engine steam stratifier. 4,333,423, Cl. 123-23.000.
Fischer, Gert: *See*—
Lang, Raimund; Quittkat, Jorg; Fischer, Gert; and Lather, Dieter, 4,333,347, Cl. 73-642.000.
Fischer & Porter Co.: *See*—
Longley, Karl E.; Ratigan, Brian; and Davis, James W., 4,333,833, Cl. 210-198.100.
Fisher, John M., to B. F. Goodrich Company, The. Escape slide. 4,333,546, Cl. 182-48.000.
Fisher, Richard J.: *See*—
Lange, Ronald E.; and Fisher, Richard J., 4,334,289, Cl. 364-900.000.
Fisons Limited: *See*—
Gates, Peter S.; Baldwin, Derek; Wilson, Carol A.; and Gillon, John, 4,333,759, Cl. 71-88.000.
Fjallstrom, Bengt. Method for internal washing or cleaning and rinsing or drying of tubular materials. 4,333,773, Cl. 134-22.00C.
Flansburg, Donald G., to Howard, Henry H. Multi-compartment container with pop-top and communicating door. 4,333,581, Cl. 220-20.000.
Flax, Eli A. Whip finish knot tying aid. 4,333,614, Cl. 242-1.000.
Fleisher, Martin, to Sloan-Kettering Institute for Cancer Research. Diagnostic device for fecal occult blood and method of use. 4,333,734, Cl. 23-230.00B.
Fleming, James C.: *See*—
Adin, Anthony; and Fleming, James C., 4,334,005, Cl. 430-211.000.
Flexible Steel Lacing Company: *See*—
Pray, Winston C., 4,333,217, Cl. 29-243.510.
Flexitallic Gaskets Limited: *See*—
Booth, Geoffrey, 4,333,975, Cl. 428-65.000.
Flood, Lawrence C., to Dollinger Corporation. Panel filter housing. 4,333,579, Cl. 220-4.00R.
Flynn, Hugh G. Method of generating energy by acoustically induced cavitation fusion and reactor therefor. 4,333,796, Cl. 376-100.000.
FMC Corporation: *See*—
Engel, John F., 4,333,950, Cl. 424-305.000.
Mueller, Wilfred; Inghram, Donald M.; and Walker, William B., 4,333,607, Cl. 239-13.000.
Ford Motor Company: *See*—
Gavasso, John M.; Bodnar, Louis G.; and Parker, Walter E., 4,333,426, Cl. 123-90.270.
Onofrio, David A., 4,333,888, Cl. 261-34.00B.
Foster, Francis G.: *See*—
Duggleby, Peter M.; Foster, Francis G.; and Nooi, Jacobus R., 4,333,844, Cl. 252-97.000.
Foster Wheeler Energy Corporation: *See*—
Stewart, Robert D.; and Gamble, Robert L., 4,333,909, Cl. 422-141.000.
Fox, Mark A., to Marathon Manufacturing Company. Tilt rod support for a Venetian blind. 4,333,510, Cl. 160-177.000.
Francis, John H.: *See*—
Bill, Colin S.; Cockshott, Charles P.; and Francis, John H., 4,334,207, Cl. 336-136.000.
Franklin, Paul E., to Crosfield Electronics Limited. Interpolation methods and apparatus. 4,334,240, Cl. 358-78.000.
Frassek, Karl H.: *See*—
Beck, Heinz; Frassek, Karl H.; Giezen, Egenius A.; and Verhulst, Eduard M., 4,334,038, Cl. 525-207.000.
Frazier, John D.; Grandfield, Wilmur G.; and Brainerd, Michael G., to Tire-Tronics, Inc. Continuous heat and pressure surveillance system for pneumatic tires. 4,334,215, Cl. 340-539.000.
Freeman, Richard R.; and White, Jonathan C., to Bell Telephone Laboratories, Incorporated. Laser induced collisional laser pumping. 4,334,200, Cl. 372-90.000.
Freitag, Dieter; Reinking, Klaus; Idel, Karsten; Medem, Harald; and Bottenbruch, Ludwig, to Bayer Aktiengesellschaft. Process for the preparation of aromatic polyesters and the use thereof for the production of injection molded articles, films and coatings. 4,334,053, Cl. 528-179.000.
Freitag, Dieter: *See*—
Schreckenberg, Manfred; Freitag, Dieter; Burgdorfer, Hans-Heribert; Lehnert, Gunther; Adelmann, Siegfried; and Rudolph, Hans, 4,333,809, Cl. 204-159.140.
Friedrichs, Karl-Gerd, to Goetze AG. Flat gasket. 4,333,663, Cl. 277-235.00R.
Frisk, Olof E., to Mo och Domsjo Aktiebolag. Apparatus for removing particulate material from a pile thereof. 4,333,560, Cl. 198-519.000.
Fritz Eichenauer, Firma: *See*—
Roller, Hanno; Ohnmacht, Helmut; Lieber, Ludwig; and Nauerth, Karl-Heinz, 4,334,141, Cl. 219-283.000.
Fritz Gegauf Aktiengesellschaft Bernina-Nahmaschinenfabrik: *See*—
Lerch, Werner, 4,333,407, Cl. 112-237.000.
Frost, Rodney I.; McBrayer, Robert D.; and Pujari, Vimal K., to Corning Glass Works. Method for improving thermal shock resistance of honeycombed structures formed from joined cellular segments. 4,333,518, Cl. 165-8.000.
Frullini, Alberto: *See*—
Maselli, Maria; Frullini, Alberto; Elbetti, Meri; and Frullini, Luisa, 4,333,408, Cl. 112-121.150.
Frullini, Luisa: *See*—
Maselli, Maria; Frullini, Alberto; Elbetti, Meri; and Frullini, Luisa, 4,333,408, Cl. 112-121.150.
Frykhult, Rune H., to AB Celleco. Separation of pulp flow. 4,333,572, Cl. 209-17.000.
Fuchs, Francis J., Jr.: *See*—
Vaughn, George A.; and Fuchs, Francis J., Jr., 4,333,649, Cl. 273-73.00D.
Fuderer, Andrija, to Union Carbide Corporation. Two-feed pressure swing adsorption process. 4,333,744, Cl. 55-25.000.
Fuji Photo Film Co., Ltd.: *See*—
Aoki, Kozo; Seoka, Yoshio; and Yokota, Yukio, 4,334,011, Cl. 430-552.000.
Horie, Seiji; and Sato, Hideo, 4,334,001, Cl. 430-83.000.

Igarashi, Akira; and Matsukawa, Hiroharu, 4,333,984, Cl. 428-336.000.
Kitajima, Masao; Tachikawa, Hiromichi; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,334,006, Cl. 430-254.000.
Mifune, Hiroyuki; Ishiguro, Shoji; Shishido, Tadao; Fuseya, Yoshiharu; and Tsujikawa, Teruaki, 4,334,010, Cl. 430-551.000.
Mifune, Hiroyuki; Shishido, Tadao; Ishiguro, Shoji; and Ueyanagi, Jisaburo, 4,334,014, Cl. 430-611.000.
Shirahata, Ryuji; Yanai, Akio; and Kitamoto, Tatsuji, 4,333,985, Cl. 428-336.000.
Yamada, Yasuyuki; Masuyama, Kenichi; and Kitamoto, Tatsuji, 4,333,988, Cl. 428-425.900.
Fujii, Masaki; and Miyabayashi, Mitsutaka, to Mitsubishi Petrochemical Company Limited. Propylene block copolymers. 4,334,040, Cl. 525-321.000.
Fujii, Yuichi: *See—*
Takeuchi, Osamu; Aoki, Kiyoshi; and Fujii, Yuichi, 4,333,777, Cl. 148-128.000.
Fujino, Hitoshi, to Alps Electric Co., Ltd. Connection device for spaced electric components. 4,333,689, Cl. 308-3.00R.
Fujita, Taketoshi; Ohgi, Yasuyuki; and Nemoto, Yousui, to Mitsubishi Petrochemical Co., Ltd. Unsaturated polyester resin composition. 4,334,035, Cl. 525-34.000.
Fujitsu Fanuc Limited: *See—*
Imazeki, Ryoji; and Yamazaki, Etsuo, 4,334,272, Cl. 364-474.000.
Imazeki, Ryoji; Yamazaki, Etsuo; and Sasaki, Takao, 4,334,281, Cl. 364-723.000.
Fujitsu Limited: *See—*
Kamioka, Hajime, 4,333,774, Cl. 148-1.500.
Fujiwara, Yasuo: *See—*
Kojima, Ichiro; Maruhashi, Kenji; and Fujiwara, Yasuo, 4,334,021, Cl. 435-118.000.
Fukuda, Mitsutoshi: *See—*
Koyama, Kenji; Ohno, Syotaro; and Fukuda, Mitsutoshi, 4,333,870, Cl. 260-112.00B.
Fukui, Akito: *See—*
Konoki, Keizo; Nobue, Michio; Fukui, Akito; and Inoue, Shigeru, 4,334,096, Cl. 564-72.000.
Fukuoka, Katsuya: *See—*
Sugiura, Taku; Fukuoka, Katsuya; Inoue, Tomihiko; Kanbe, Masayoshi; and Iwama, Toshio, 4,333,512, Cl. 164-453.000.
Fuller, Ernest H. Gutter guard clip and method of manufacture. 4,333,208, Cl. 24-1.000.
Funamoto, Hiroyuki: *See—*
Matsuno, Kenji; and Funamoto, Hiroyuki, 4,334,138, Cl. 219-64.000.
Funcik, Jack F.; Bennet, Joseph C.; Tubbs, Joseph T.; and Schneider, Thomas E., to Molex Incorporated. Machine for making an electrical harness. 4,333,230, Cl. 29-749.000.
Furukawa, Hisao: *See—*
Yonezawa, Kazuya; Furukawa, Hisao; and Azuma, Masaaki, 4,334,036, Cl. 525-102.000.
Furukawa, Toru, to Wistar Institute of Anatomy and Biology, The. Human osteogenic sarcoma cell line and use thereof for immunofluorescent antibody test. 4,334,016, Cl. 435-5.000.
Furusawa, Taketoshi: *See—*
Maki, Hiroya; Furusawa, Taketoshi; and Takaishi, Takeo, 4,333,908, Cl. 422-61.000.
Furuta, Kenji, to Olympus Optical Company Limited. Tape recorder with display showing tape travel direction. 4,334,149, Cl. 235-92.0MP.
Fuseya, Yoshiharu: *See—*
Mifune, Hiroyuki; Ishiguro, Shoji; Shishido, Tadao; Fuseya, Yoshiharu; and Tsujikawa, Teruaki, 4,334,010, Cl. 430-551.000.
Fushida, Mineto: *See—*
Okamoto, Miyoshi; and Fushida, Mineto, 4,333,976, Cl. 428-91.000.
Futami, Toshio: *See—*
Hiroshima, Minoru; Futami, Toshio; and Ohta, Hirofumi, 4,334,290, Cl. 365-1.000.
Fuxelius, Kaj O. H., to Billingsfors Bruks Aktiebolag. Water barrier flotation curtain. 4,333,726, Cl. 405-72.000.
Gabriel, Melvin E.; and Van Baalen, Joseph M., to Zenith Radio Corporation. Horizontal width control circuit for image display apparatus. 4,334,173, Cl. 315-399.000.
Gala, Hiren S.: *See—*
Orr, David A.; Gala, Hiren S.; and Scagnelli, George J., 4,333,232, Cl. 29-767.000.
Gall, John C., to Sears, Roebuck and Co. Container closure. 4,333,584, Cl. 220-309.000.
Gamble, Robert L.: *See—*
Stewart, Robert D.; and Gamble, Robert L., 4,333,909, Cl. 422-141.000.
Ganellin, Charon R.: *See—*
Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., 4,333,946, Cl. 424-273.00R.
Gardner, David L. Pipe coating apparatus. 4,333,783, Cl. 156-187.000.
Gardner, Jeffrey M., to Container Corporation of America. Six-cell partition. 4,333,600, Cl. 229-42.000.
Gardner, Lloyd E.; Farha, Floyd E., Jr.; Eastman, Alan D.; and Drehman, Lewis E., to Phillips Petroleum Company. Promoted zinc titanate as catalytic agent. 4,333,855, Cl. 252-439.000.
Garner, James W., to Grow Group, Inc. Coating composition thinner for decreasing pollution resulting from the application of a coating composition. 4,333,845, Cl. 252-170.000.
Garrett Corporation, The: *See—*
Gibbs, Craig A., 4,333,659, Cl. 277-1.000.
McCarty, Frederick B., 4,334,160, Cl. 310-57.000.
Garrett Electronics: *See—*
Podhrasky, Robert J., 4,334,191, Cl. 324-329.000.
Podhrasky, Robert J., 4,334,192, Cl. 324-329.000.
Garrison, Robert L.: *See—*
Wyner, Elliott F.; Burr, Orville R.; and Garrison, Robert L., 4,334,172, Cl. 315-289.000.
Gates, Peter S.; Baldwin, Derek; Wilson, Carol A.; and Gillon, John, to Fisons Limited. Herbicidal 5-cyano-2,3-dihydro-benzofuran-2-ones. 4,333,759, Cl. 71-88.000.
Gauhl, Helmgard; Schawohl, Georg; Seidel, Hans; and Beaucamp, Klaus, to Boehringer Mannheim GmbH. Process for obtaining cholesterol oxidase. 4,334,023, Cl. 435-190.000.
Gauthier, Francois A.: *See—*
Cornish, William D.; and Gauthier, Francois A., 4,334,202, Cl. 333-218.000.
Gavasso, John M.; Bodnar, Louis G.; and Parker, Walter E., to Ford Motor Company. Internal combustion engine construction. 4,333,426, Cl. 123-90.270.
Gazzo, John J.: *See—*
De Luca, Paul V.; Gazzo, John J.; and Hollfelder, Thomas A., 4,334,129, Cl. 179-175.110.
Gebel, Rudolf; Peche, Gerhard; Schindler, Heinrich; and Welly, Jurgen-Dietrich, to Siemens Aktiengesellschaft. Contact arrangement for vacuum switches. 4,334,133, Cl. 200-279.000.
Gehrmann, Klaus: *See—*
Kubbeler, Hans-Klaus; Erpenbach, Heinz; Gehrmann, Klaus; and Schmitz, Klaus, 4,333,884, Cl. 260-546.000.
Geisler, Robert C., to Keystone Consolidated Industries, Inc. Perforated board display bracket assembly. 4,333,628, Cl. 248-551.000.
Geist, Robert W. Mesentery tube holder apparatus. 4,333,468, Cl. 128-348.000.
Gelenkwellenbau GmbH: *See—*
Bischoff, Walter, 4,333,319, Cl. 464-26.000.
Gen Engineering, Ltd.: *See—*
Ono, Hiroshi; and Mizoi, Kazutoshi, 4,334,315, Cl. 455-11.000.
General Atomic Company: *See—*
Holko, Kenneth H., 4,333,670, Cl. 285-173.000.
Holko, Kenneth H., 4,333,671, Cl. 285-173.000.
General Electric Company: *See—*
Bennett, Moreland P., 4,334,122, Cl. 174-94.00R.
Billings, David L.; Fey, Robert M.; and Waugh, Richard A., 4,333,322, Cl. 68-23.200.
Carson, Andrew B., Jr.; and Harris, Samuel C., Jr., 4,333,398, Cl. 101-93.020.
Chow, Tat-Sing P.; and Ghezzo, Mario, 4,333,965, Cl. 427-93.000.
Cushing, Donald S., 4,334,143, Cl. 219-333.000.
Daniels, William H.; and Cheatham, John B., Jr., 4,333,540, Cl. 175-329.000.
Davidson, Craig R.; and Sedlak, John M., 4,333,805, Cl. 204-98.000.
Ghezzo, Mario, 4,333,964, Cl. 427-93.000.
Gordy, Lester A.; and Poff, David A., 4,334,193, Cl. 324-437.000.
Haag, Donald L.; and Woods, Lee O., 4,334,162, Cl. 310-68.00C.
Kochanowski, John E., 4,334,030, Cl. 521-90.000.
Latos, Edward L., 4,334,262, Cl. 362-11.000.
Moffatt, William G., 4,334,165, Cl. 310-233.000.
Payne, Thomas R., 4,334,147, Cl. 219-497.000.
Poole, William F., 4,334,132, Cl. 200-153.0LB.
Sandland, Paul, 4,334,154, Cl. 250-445.00T.
Sawyer, George N., 4,333,317, Cl. 62-212.000.
Schreck, Raymond M.; Brown, Bill G.; and Gilda, David A., 4,333,588, Cl. 222-164.000.
Smith, Peter H., 4,334,135, Cl. 219-10.49R.
Stamp, Custis L., Jr.; and Herzog, Rollie R., 4,333,316, Cl. 62-126.000.
Stehman, Harold E.; and Daniels, Herbert E., 4,334,153, Cl. 250-405.000.
Stokes, Vijay K., 4,333,323, Cl. 68-171.000.
Stottman, Richard L.; and Smith, Peter H., 4,333,521, Cl. 165-63.000.
White, Dwain M., 4,334,050, Cl. 525-390.000.
General Foods Corporation: *See—*
Zemelman, Valery B.; Kleiner, Fredric; and Kuchman, Michael J., 4,333,315, Cl. 62-1.000.
General Motors Corporation: *See—*
Faryna, Myron; and Morphet, Kerry A., 4,333,889, Cl. 261-39.00B.
General Tire & Rubber Company, The: *See—*
Erickson, David E., 4,333,785, Cl. 156-281.000.
Erickson, David E., 4,333,787, Cl. 156-307.300.
Genho, Robert K., Sr., to Lasertron Company. Construction laser. 4,333,242, Cl. 33-227.000.
George Kent Limited: *See—*
Allen, Eric H. W., 4,334,037, Cl. 525-199.000.
Geosource Inc.: *See—*
Ciccozzi, Frederick A., 4,333,486, Cl. 137-1.000.
Germann, Willy, to BBC Brown, Boveri & Company, Ltd. Shielding cylinder and method of manufacture. 4,333,223, Cl. 29-447.000.
Geschwender, Robert C., to Concept Engineering Inc. Reclosable container. 4,333,602, Cl. 229-44.00R.
Getting, Milan J.: *See—*
Civardi, Frank P.; Sova, Stanley G.; and Getting, Milan J., 4,333,786, Cl. 156-306.600.
Geusic, Joseph E.; Muehlner, Dirk J.; and Nelson, Terence J., to Bell Telephone Laboratories, Incorporated. Ion-implanted magnetic bubble memory with domain confinement rails. 4,334,291, Cl. 365-36.000.

Ghezzo, Mario, to General Electric Company. Method of making integrated circuits. 4,333,964, Cl. 427-93.000.
Ghezzo, Mario: *See—*
Chow, Tat-Sing P.; and Ghezzo, Mario, 4,333,965, Cl. 427-93.000.
Gibb, James M. Differential pressure sensing device. 4,333,350, Cl. 73-715.000.
Gibbard, Henry F., to Gould Inc. Air cathode for air depolarized cells. 4,333,993, Cl. 429-27.000.
Gibbs, Craig A., to Garrett Corporation, The. Turbocharger shaft seal arrangement. 4,333,659, Cl. 277-1.000.
Gieschen, Kurt; and Reinger, Friedrich, to U.S. Philips Corporation. X-ray examination apparatus, comprising an examination table which can be swivelled around a horizontal axis. 4,334,155, Cl. 250-490.000.
Giezen, Egenius A.: *See—*
Beck, Heinz; Frassek, Karl H.; Giezen, Egenius A.; and Verhulst, Eduard M., 4,334,038, Cl. 525-207.000.
Gilbert Mfg., Co., Inc.: *See—*
Schick, Henry, 4,333,701, Cl. 339-97.00P.
Gilda, David A.: *See—*
Schreck, Raymond M.; Brown, Bill G.; and Gilda, David A., 4,333,588, Cl. 222-164.000.
Gilden, Meyer; Cullen, Donald E.; and Grudkowski, Thomas W., to United Technologies Corporation. Fluid damped saw accelerometer. 4,333,342, Cl. 73-516.00R.
Gillette Company, The: *See—*
Ascoli, Enzo, 4,334,163, Cl. 310-90.000.
Gillon, John: *See—*
Gates, Peter S.; Baldwin, Derek; Wilson, Carol A.; and Gillon, John, 4,333,759, Cl. 71-88.000.
Gillotti, Michael A. Massage and therapeutic body work table. 4,333,638, Cl. 269-322.000.
Ginatta, Marco, to Snamprogetti S.p.A.; and Elettrochimica Marco Ginatta S.p.A. Method and machine for recovering material from consumed accumulator batteries. 4,333,219, Cl. 29-403.300.
Giovetti, Giuliano. Sporting implement structure, particularly for soccer game practicing. 4,333,658, Cl. 273-411.000.
Girardi, Gerardo, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. Data-handling system with operatively interconnected processors. 4,334,305, Cl. 370-86.000.
Gitlin, Richard D.; and Meadors, Howard C., Jr., to Bell Telephone Laboratories, Incorporated. Timing recovery technique. 4,334,313, Cl. 375-106.000.
GK Technologies, Incorporated: *See—*
Brorein, William J., 4,333,699, Cl. 339-61.00M.
GKN Sankey Limited: *See—*
Golding, Cyril G., 4,333,504, Cl. 141-55.000.
Gliniorz, Lothar: *See—*
Schoettle, Klaus; and Gliniorz, Lothar, 4,333,619, Cl. 242-195.000.
Goettl, Adam D. Automatic flushing and draining apparatus for evaporative coolers. 4,333,887, Cl. 261-27.000.
Goetze AG: *See—*
Friedrichs, Karl-Gerd, 4,333,663, Cl. 277-235.00R.
Goff, James R. Tumbling apparatus. 4,333,276, Cl. 51-422.000.
Gogins, Laird B., to Power-Matic Corporation. Variable speed transmission. 4,333,555, Cl. 192-58.00R.
Golding, Cyril G., to GKN Sankey Limited. Container filling machine. 4,333,504, Cl. 141-55.000.
Gonzales, Roman Y., to Gould Inc. Universal input/output system construction for programmable controllers. 4,334,261, Cl. 361-426.000.
Goodyear Tire & Rubber Company, The: *See—*
Hogan, James M.; and Becht, Cletus A., 4,333,899, Cl. 264-51.000.
Schmit, Georges J. E.; and Welter, Thomas N. H., 4,333,507, Cl. 152-359.000.
Young, Gerald T.; Easterling, Michael R.; and Dukeshire, Robert E., 4,333,901, Cl. 264-85.000.
Gordon, John F., to Marconi Company Limited, The. Secondary surveillance radar. 4,334,224, Cl. 343-6.50R.
Gordy, Lester A.; and Poff, David A., to General Electric Company. Cell tester for use with microprocessor. 4,334,193, Cl. 324-437.000.
Gotoh, Kyugo: *See—*
Naito, Hiroyuki; Maruya, Takashi; Gotoh, Kyugo; and Ohmori, Hideyo, 4,334,029, Cl. 501-109.000.
Goudsche Machinefabriek B.V.: *See—*
Mann, Adriaan B., 4,333,331, Cl. 73-4.00R.
Gould Inc.: *See—*
Gibbard, Henry F., 4,333,993, Cl. 429-27.000.
Gonzales, Roman Y., 4,334,261, Cl. 361-426.000.
Swanger, Lee A., 4,333,215, Cl. 29-149.50S.
Govoni, Gabriele; Rubichi, Gianfranco; and Guardigli, Pierluigi, to Montedison S.p.A. Continuous process for recovering polymers from their latexes. 4,334,057, Cl. 528-500.000.
Graham Magnetics, Inc.: *See—*
Deffeyes, Robert J.; and Armstrong, Harris W., 4,333,966, Cl. 427-96.000.
Graham, Paul D.: *See—*
McConnell, Michael V.; and Graham, Paul D., 4,334,211, Cl. 340-88.000.
Granda, Edward J.: *See—*
Mookherjee, Braja D.; Trenkle, Robert W.; Wilson, Richard A.; Schmitt, Frederick L.; Vock, Manfred H.; Granda, Edward J.; Vinals, Joaquin; Kiwala, Jacob; and Schreiber, William L., 4,334,098, Cl. 568-347.000.
Grandfield, Wilmur G.: *See—*
Frazier, John D.; Grandfield, Wilmur G.; and Brainerd, Michael G., 4,334,215, Cl. 340-539.000.
Grant Industries Incorporated: *See—*
Keefe, Tom; and Rosellini, Bruno, 4,333,690, Cl. 308-3.800.
Grassl, Hans-Peter: *See—*
Herbst, Heiner; Pfleiderer, Hans-Joerg; and Grassl, Hans-Peter, 4,334,150, Cl. 250-201.000.
Herbst, Heiner; Pfleiderer, Hans-Joerg; and Grassl, Hans-Peter, 4,334,151, Cl. 250-201.000.
Grattapaglia, Giorgio P., to Fiat-Allis Macchine Movimento Terra S.p.A. Power-shift countershaft type transmission. 4,333,358, Cl. 74-359.000.
Greco, Alberto; and Bertolini, Guglielmo, to Anic S.p.A.; and Snamprogetti S.p.A. Process for reducing metal alkoxides, and the use of the compounds so obtained. 4,333,881, Cl. 260-429.00R.
Green, Frederick A.; Simpson, George R.; Avery, Stephen T.; and Durbin, John A., to Xerox Corporation. Full frame flash illumination system utilizing a diffuse integrating optical cavity. 4,333,723, Cl. 355-71.000.
Greene, James M.; and Bunnell, Charles A., to Eli Lilly and Company. Synthesis of substituted benzyl esters. 4,334,079, Cl. 560-75.000.
Greenhalgh, Colin W.: *See—*
Carey, John L.; and Greenhalgh, Colin W., 4,333,877, Cl. 548-421.000.
Greiner, James G.; Lehman, Joseph J.; and Priepke, Edward H., to Sperry Corporation. Adjustable crop guide apparatus. 4,333,304, Cl. 56-119.000.
Grens, Edward A., II: *See—*
Vermeulen, Theodore; Grens, Edward A., II; and Holten, Ronald R., 4,333,815, Cl. 208-10.000.
Greschner, Johann: *See—*
Bohlen, Harald; Engelke, Helmut; Kulcke, Werner; Nehmiz, Peter; and Greschner, Johann, 4,334,156, Cl. 250-491.000.
Griffin, Mary T. Flower bud. 4,333,778, Cl. 156-61.000.
Grimes, Terrence L.; and Swartz, Harold L., to Sperry Corporation. Apparatus for demodulating a pulse excited synchro position sensor. 4,334,179, Cl. 318-661.000.
Grimm, Hugo: *See—*
Dorr, Karl H.; Diekmann, Helmut; Grimm, Hugo; Sander, Ulrich; Tacke, Michael; and Weber, Waldemar, 4,333,917, Cl. 423-522.000.
Grimm, Jakob, to Inauen Machinen AG. Aluminum foil lined package, particularly suitable for oil- and fat-containing products. 4,333,601, Cl. 229-43.000.
Griswold Controls: *See—*
Griswold, David E.; and Veit, Richard E., 4,333,495, Cl. 137-484.200.
Griswold, David E.; and Veit, Richard E., to Griswold Controls. Check valve assembly. 4,333,495, Cl. 137-484.200.
Grodau, Dieter: *See—*
Altenschopfer, Theodor; Schumann, Klaus; and Grodau, Dieter, 4,333,771, Cl. 134-7.000.
Groepper, Jurgen, to Pennwalt Corporation. Metallic salt pre-treatment of crosslinkable co-polymers for eliminating tackiness. 4,334,043, Cl. 525-370.000.
Grote, Daniel A.: *See—*
Munoz, Donald L.; Grote, Daniel A.; Bronder, David G.; and Weis, Gerald J., 4,333,678, Cl. 296-39.00R.
Grove Valve and Regulator Company: *See—*
Chow, Peter C. M.; and Ringer, William N., 4,333,496, Cl. 137-489.000.
Grow Group, Inc.: *See—*
Garner, James W., 4,333,845, Cl. 252-170.000.
Grudkowski, Thomas W.: *See—*
Gilden, Meyer; Cullen, Donald E.; and Grudkowski, Thomas W., 4,333,342, Cl. 73-516.00R.
Grundig E.M.V.: *See—*
Mangold, Hans, 4,334,242, Cl. 358-127.000.
GTE Automatic Electric Labs Inc.: *See—*
Janda, George M., 4,334,134, Cl. 200-314.000.
GTE Products Corporation: *See—*
Dennis, Philip J., 4,334,209, Cl. 337-112.000.
Wyner, Elliott F.; Burr, Orville R.; and Garrison, Robert L., 4,334,172, Cl. 315-289.000.
Guardall Limited: *See—*
Dodson, Peter J.; and Horwood, Kenneth E., 4,333,233, Cl. 29-845.000.
Guardigli, Pierluigi: *See—*
Govoni, Gabriele; Rubichi, Gianfranco; and Guardigli, Pierluigi, 4,334,057, Cl. 528-500.000.
Guichard, Francoise: *See—*
Creuzet, Marie-Helene; Feniou, Claude; Guichard, Francoise; and Prat, Gisele, 4,333,930, Cl. 424-248.510.
Guillaume, Jacques; Nedelec, Lucien; and Dumont, Claude, to Roussel Uclaf. Tetrahydropyridinyl-indoles. 4,333,939, Cl. 424-263.000.
Guins, Sergei G.: *See—*
Tack, Carl E.; and Guins, Sergei G., 4,333,403, Cl. 105-197.00R.
Gulf Research & Development Company: *See—*
Pellegrini, John P., Jr.; Beach, David L.; and Kobylinski, Thaddeus P., 4,334,113, Cl. 585-18.000.
Schulz, Johann G. D., 4,334,084, Cl. 562-410.000.
Gunther, Conrad J., to Dzus Fastener Co., Inc. Slip-on receptacle. 4,333,211, Cl. 24-221.00R.
Gurry, George W. Battery-powered receivers. 4,334,319, Cl. 455-227.000.
Gutsche, Klaus: *See—*
Scharwaechter, Peter; Gutsche, Klaus; Kohlmann, Wilhelm; Kroemer, Gerhard, deceased; Kroemer, Norma, legal representative;

Kroemer, Helmut, legal representative; and Kroemer, Maria M., legal representative, 4,333,936, Cl. 424-251.000.
Guzay, Casimir M.; and Wright, James A., to Panduit Corp. Pneumatic sensor. 4,333,633, Cl. 251-320.000.
H. K. Porter, Inc.: *See*—
Porter, Thomas M., 4,333,330, Cl. 72-392.000.
Haag, Donald L.; and Woods, Lee O., to General Electric Company. Releasable combination and method of assembly. 4,334,162, Cl. 310-68.00C.
Haddock, Paul D. Detachable trailer hitch. 4,333,665, Cl. 280-408.000.
Haffer, Gregor: *See*—
Neef, Gunter; Eder, Ulrich; Haffer, Gregor; Sauer, Gerhard; Wiechert, Rudolf; and Steinbeck, Hermann, 4,333,928, Cl. 424-243.000.
Hagen, Jens; and Bruns, Klaus, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Production of aldehydes. 4,334,100, Cl. 568-444.000.
Hagiwara, Isao: *See*—
Yoshida, Hiroshi; Hagiwara, Isao; and Oodera, Shigeyuki, 4,333,903, Cl. 264-165.000.
Hagiwara, Teruo: *See*—
Takami, Satoshi; Hagiwara, Teruo; Kando, Toru; and Kuroki, Yoshifumi, 4,333,719, Cl. 354-132.000.
Haikkala, Pekka O., to Oy. Tampella AB. Apparatus for continuously grinding wood under pressure and continuously discharging groundwood. 4,333,613, Cl. 241-34.000.
Hale, Joseph T.: *See*—
DePaolo, James F.; Hale, Joseph T.; and Holmberg, Carl F., 4,333,271, Cl. 49-464.000.
Hall, Ernest M., Jr., to Western Geophysical Co. of America. Seismic method and apparatus. 4,334,296, Cl. 367-180.000.
Ham, David O., to University of Rochester, The. Excimer laser. 4,334,199, Cl. 372-57.000.
Hamano, Eizaburou: *See*—
Takenaka, Shigeo; Hamano, Eizaburou; and Koshigoe, Shinpei, 4,334,169, Cl. 313-414.000.
Hamilton, Joel A. Form fill and seal package making. 4,333,299, Cl. 53-450.000.
Hamilton, Martin B. Pin-turning articles and methods, for handling load objects. 4,333,617, Cl. 242-86.520.
Hamisch, Paul H., Jr.; and Pabodie, Robert M., to Monarch Marking Systems, Inc. Method of making print head. 4,333,399, Cl. 101-401.200.
Hammacher, Margaret F. Carrying handle for detachable containers and containers including such handle. 4,333,569, Cl. 206-431.000.
Hammond, Kenneth G., to Texaco Inc. Synthesis of 4-haloalkyl alcohols. 4,334,109, Cl. 568-841.000.
Hammonds, James C., to ACF Industries, Incorporated. Hitch head having interlocking jaw mechanism. 4,333,666, Cl. 280-435.000.
Hanada, Kazunori: *See*—
Tamai, Masaharu; Adachi, Takashi; Morimoto, Shigeo; Oguma, Kiyoshi; Hanada, Kazunori; and Omura, Sadafumi, 4,333,879, Cl. 549-549.000.
Hancock, John C.; Winwood, John M.; and Wilkinson, Noel R., to Robert Morton D.G. Limited. Pitching mechanism for lauter tun knives. 4,333,393, Cl. 99-277.200.
Hanna, William T.: *See*—
Wilkinson, William H.; and Hanna, William T., 4,333,515, Cl. 165-1.000.
Hanotier-Bridoux, Monique J. S.: *See*—
Hanotier, Jacques D. V.; and Hanotier-Bridoux, Monique J. S., 4,334,086, Cl. 562-413.000.
Hanotier, Jacques D. V.; and Hanotier-Bridoux, Monique J. S., to Labofina S.A. Production of terephthalic acid. 4,334,086, Cl. 562-413.000.
Hansard, Robert C.; and Brink, E. R., Jr. Film or tape retainer device for reels. 4,333,563, Cl. 206-53.000.
Hansen, Kirsten: *See*—
Terrell, Ross C.; and Hansen, Kirsten, 4,334,105, Cl. 568-682.000.
Hara, Akio, to Sumitomo Electric Industries, Ltd. Process of producing a sintered compact. 4,333,902, Cl. 264-320.000.
Hara, Akio: *See*—
Tsuji, Kazuo; Yazu, Shuji; and Hara, Akio, 4,333,986, Cl. 428-402.000.
Hara, Toshitami: *See*—
Shirato, Yoshiaki; Takatori, Yasushi; Hara, Toshitami; Nishimura, Yukuo; and Takahashi, Michiko, 4,334,234, Cl. 346-140.00R.
Harada, Haruhisa: *See*—
Nakazeki, Tsugito; and Harada, Haruhisa, 4,333,435, Cl. 123-489.000.
Harada, Hiroshi: *See*—
Abe, Haruhiko; Nagatomo, Masao; Tsubouchi, Natsuro; Harada, Hiroshi; and Mitsuhashi, Junichi, 4,333,226, Cl. 29-576.00B.
Harada, Norio: *See*—
Kawakita, Kenji; Makino, Takenori; and Harada, Norio, 4,334,285, Cl. 364-761.000.
Hardwick, Roy, to Explosive Fabricators. Method of explosively forming bi-metal tubeplate joints. 4,333,597, Cl. 228-108.000.
Hardy, James E.; and Knarr, John J., to Exxon Research & Engineering Co. Process and apparatus for measuring gaseous fixed nitrogen species. 4,333,735, Cl. 23-232.00R.
Hardy, Raymond D.; and Van Steenwyk, William E. Vehicle top transported, self contained camper. 4,333,679, Cl. 296-161.000.
Hareng, Michel: *See*—
Dubois, Jean-Claude; Zann, Annie; Billard, Jean; and Hareng, Michel, 4,333,709, Cl. 350-350.00R.
Hargest, Thomas S., III. Automatic tubular feeding apparatus and method. 4,333,454, Cl. 128-214.00R.
Harris, Jesse W.; and Lutich, Louis L. Impact drilling tool having improved valving. 4,333,537, Cl. 173-17.000.
Harris, Samuel C., Jr.: *See*—
Carson, Andrew B., Jr.; and Harris, Samuel C., Jr., 4,333,398, Cl. 101-93.020.
Harrison, Raymond G.: *See*—
Bowley, Inez; and Harrison, Raymond G., 4,333,924, Cl. 424-170.000.
Hart, Andrew J.: *See*—
Nailor, Michael T.; and Hart, Andrew J., 4,333,392, Cl. 98-1.000.
Hartmann, Heinrich: *See*—
Lehner, August; Hartmann, Heinrich; Heil, Guenter; Lenz, Werner; Buethe, Ingolf; and Bachmann, Rudolf, 4,334,034, Cl. 525-28.000.
Hartzler, Harold E., to Miles Laboratories, Inc. Reflux condenser. 4,333,523, Cl. 165-73.000.
Harvill, William A.: *See*—
Fessler, Herman S.; and Harvill, William A., 4,333,587, Cl. 222-129.100.
Hasegawa, Kengo: *See*—
Yanadori, Michio; Hasegawa, Kengo; and Uchida, Motokazu, 4,333,520, Cl. 165-59.000.
Hashimoto, Katsuhiko; Nambu, Hirohiko; Watari, Kazuhiro; Mizuno, Kenichi; Murakami, Tadateru; Matsuoka, Yutaka; Moriyama, Mitsutoshi; and Ohno, Norio, to Mitsu Petrochemical Industries Ltd. Process and apparatus for preparation of phenols. 4,334,108, Cl. 568-803.000.
Hatano, Hajime: *See*—
Koizumi, Hajime; Toyama, Kozo; Kobayashi, Mikio; Hatano, Hajime; Saeki, Toshio; Mizukoshi, Kaoru; Tamanaga, Shinichi; Miyakawa, Keizo; and Kato, Tomoyasu, 4,333,285, Cl. 52-252.000.
Hatebur Umformmaschinen AG: *See*—
Richner, Hans, 4,333,329, Cl. 72-3.000.
Hauck, Karl: *See*—
Nagel, Peter; Schoettle, Klaus; Wittkamp, Reinrich; and Hauck, Karl, 4,333,418, Cl. 118-106.000.
Hauenstein, Alfred, to Siemens Aktiengesellschaft. Electronic sensor on/off switch. 4,334,183, Cl. 323-235.000.
Hauenstein, Alfred, to Siemens Aktiengesellschaft. Electronic sensor on/off switch. 4,334,184, Cl. 323-235.000.
Haug, Richard. Wall hanger hooks. 4,333,625, Cl. 248-216.100.
Hauni-Werke Korber & Co. KG: *See*—
Heitmann, Uwe; and Rudszinat, Willy, 4,333,335, Cl. 73-41.000.
Haupin, Warren E.: *See*—
Seger, Edward J.; and Haupin, Warren E., 4,333,803, Cl. 204-67.000.
Hauz, Gerhard, to Laukien, Gunther Rudi. Submersible twin-hull watercraft. 4,333,414, Cl. 114-322.000.
Hawkins, Edward, Sr. Hoop guiding and braking apparatus. 4,333,260, Cl. 46-220.000.
Hawley, Gil R.; and McDaniel, Max P., to Phillips Petroleum Company. Solubilized chromium salt in polymerization catalyst. 4,333,860, Cl. 252-458.000.
Hayashi, Hisao: *See*—
Takagi, Hidehiko; Hayashi, Hisao; Ogawa, Kazuo; and Kanaya, Yoshihiro, 4,334,137, Cl. 219-10.55F.
Hayashi, Keizo, to Toyoda Gosei Co., Ltd. Method for producing a channel shaped trim. 4,333,221, Cl. 29-413.000.
Hayashi, Takeshi, to Kyoei Zoki Kabushiki Kaisha. Apparatus for storage of ice. 4,333,612, Cl. 241-33.000.
Hayashi, Tatsuo; Itoh, Ryouichi; and Tsuji, Tatsumi, to Mitsubishi Petrochemical Company Limited; and Daisen Industry Company Limited. Method and mold for molding prefoamed particulate thermoplastic synthetic resin material. 4,333,897, Cl. 264-40.600.
Head, Donald L., to Mead Corporation, The. Laminated charge plate for an ink jet printing device and method of manufacturing same. 4,334,232, Cl. 346-75.000.
Healy, Herbert C., to United Technologies Corporation. Method for producing steam from the liquid in a moist gas stream. 4,333,992, Cl. 429-17.000.
Hedger, John H. Reciprocating engine with improved piston movement stabilizing means. 4,333,388, Cl. 91-186.000.
HEF-Fenstertechnik Vetriebs GmbH: *See*—
Janke, Bernhard, 4,333,295, Cl. 52-730.000.
Hegg, Billy S., to Bendix Corporation, The. Balanced pivoted vane valve. 4,333,390, Cl. 91-467.000.
Heiart, Robert B.: *See*—
Charles, Magalie M.; and Heiart, Robert B., 4,334,009, Cl. 430-291.000.
Heider, James E., to Owens-Illinois, Inc. Merchandising package for containers. 4,333,570, Cl. 206-432.000.
Heil, Guenter: *See*—
Lehner, August; Hartmann, Heinrich; Heil, Guenter; Lenz, Werner; Buethe, Ingolf; and Bachmann, Rudolf, 4,334,034, Cl. 525-28.000.
Heinze, Walter O.; and Tufts, Wesley M., to International Water Saving Systems, Inc. Water saving toilet system. 4,333,185, Cl. 4-319.000.
Heitmann, Uwe; and Rudszinat, Willy, to Hauni-Werke Korber & Co. KG. Apparatus for testing the wrappers of cigarettes or the like. 4,333,335, Cl. 73-41.000.
Helmus, Martin C.; and Baker, Wallace L. Filtration module with included illumination. 4,333,750, Cl. 55-259.000.

Hemschemeier, Hans: *See*—
Dorling, Rolf; and Hemschemeier, Hans, 4,333,514, Cl. 165-1.000.
Henderson, Joe W. Multi-purpose attachment for vehicles. 4,333,250, Cl. 37-117.500.
Hendrickson, Richard T.; and Carter, Joel S., to Bendix Corporation, The. Electronic adaptive ride control system. 4,333,668, Cl. 280-703.000.
Hendry, James W., to Ex-Cell-O Corporation. Injection molding nozzle. 4,333,608, Cl. 239-118.000.
Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See*—
Altenschopfer, Theodor; Schumann, Klaus; and Grodau, Dieter, 4,333,771, Cl. 134-7.000.
Hagen, Jens; and Bruns, Klaus, 4,334,100, Cl. 568-444.000.
Preuss, Wolfgang; Bahn, Michael; Schmid, Rolf; and Wagner, Rudiger, 4,333,880, Cl. 260-397.100.
Henle, Ernst: *See*—
Kuttenbaum, Valentin; and Henle, Ernst, 4,333,297, Cl. 53-252.000.
Henricson, Kaj O., to Rosenblad Corporation. Method for the recovery of easily evaporable components from hot gases. 4,333,800, Cl. 203-87.000.
Hentrich, Robert D., Sr., to Deere & Company. Disc standard assembly. 4,333,535, Cl. 172-572.000.
Herbert, Leroy. Cover for truck/trailer male electrical plug. 4,333,698, Cl. 339-36.000.
Herbst, Heiner; Pfleiderer, Hans-Joerg; and Grassl, Hans-Peter, to Siemens Aktiengesellschaft. Circuit with an exposure measuring unit for sensor controlled range measurement. 4,334,150, Cl. 250-201.000.
Herbst, Heiner; Pfleiderer, Hans-Joerg; and Grassl, Hans-Peter, to Siemens Aktiengesellschaft. Circuit provided with an exposure measuring part for sensor-controlled telemetry. 4,334,151, Cl. 250-201.000.
Herbst, Heiner; and Niemeyer, Matthias, to Siemens Aktiengesellschaft. Monolithically integrated circuit for linear image scanning with matchable sensors. 4,334,239, Cl. 358-44.000.
Hermanns, Hans: *See*—
Schuster, Friedrich; and Hermanns, Hans, 4,333,307, Cl. 57-334.000.
Herrmann, Henry O., Jr., to AMP Incorporated. Low cost high voltage connector. 4,333,702, Cl. 339-217.00R.
Herschler, Robert J. Method for the treatment of water-living animals with health modifying agents. 4,333,922, Cl. 424-89.000.
Herst, Neil W., to BJ-Hughes Inc. Rotary power slips. 4,333,209, Cl. 24-263.0DA.
Hertl, William; and Zine, Anthony R., Jr., to Sherwood Medical Industries Inc. Method of controlling rheological properties of gel-like compositions. 4,333,564, Cl. 206-216.000.
Herzog, Rollie R.: *See*—
Stamp, Custis L., Jr.; and Herzog, Rollie R., 4,333,316, Cl. 62-126.000.
Hestehave, Borge; and Hestehave, Kjeld, to Bomatic, Inc. Method for blowmolding a container. 4,333,905, Cl. 264-529.000.
Hestehave, Kjeld: *See*—
Hestehave, Borge; and Hestehave, Kjeld, 4,333,905, Cl. 264-529.000.
Heuber, Klaus; and Wiedmann, Siegfried K., to International Business Machines Corporation. Restore circuit for a semiconductor storage. 4,334,294, Cl. 365-203.000.
Heyman, Duane A.: *See*—
Otten, Jay G.; Heyman, Duane A.; and Murphy, John R., 4,334,031, Cl. 521-106.000.
Ramlow, Gerhard G.; Heyman, Duane A.; and Moore, Richard A., 4,334,049, Cl. 526-202.000.
Higgins, Robert S.; and Merritt, David T., to Otis Engineering Corporation. Side pocket mandrel and method of construction. 4,333,527, Cl. 166-117.500.
High Level Machines Corp.: *See*—
Shibasaki, Yoshihisa; Sakamura, Ken; Sakamae, Waichi; Nakano, Koichi; and Aiso, Hideo, 4,334,269, Cl. 364-200.000.
Hill, John S.: *See*—
Buettner, Carl F.; and Hill, John S., 4,333,674, Cl. 293-120.000.
Himmetsberger, Alois: *See*—
Leichtfried, Friedrich; and Himmetsberger, Alois, 4,333,667, Cl. 280-605.000.
Hintsch, Otto, to Sulzer Brothers Limited. Weaving machine having a rigid frame. 4,333,501, Cl. 139-1.00R.
Hirabayashi, Yasuji: *See*—
Urasaki, Takanori; Hirabayashi, Yasuji; Ogasawara, Makoto; and Inata, Hiroo, 4,333,907, Cl. 264-290.200.
Hirai, Tadashi: *See*—
Morikawa, Minoru; Kokubu, Sadao; and Hirai, Tadashi, 4,333,325, Cl. 70-186.000.
Hiroshima, Minoru; Futami, Toshio; and Ohta, Hirofumi, to Hitachi, Ltd. Magnetic bubble memory element with heat sink. 4,334,290, Cl. 365-1.000.
Hirschfelder, Helmut: *See*—
Peroutka, Fritz; and Hirschfelder, Helmut, 4,333,836, Cl. 210-404.000.
Hitachi, Ltd.: *See*—
Hiroshima, Minoru; Futami, Toshio; and Ohta, Hirofumi, 4,334,290, Cl. 365-1.000.
Inoue, Shigeki, 4,334,125, Cl. 179-1.0GE.
Ito, Yukio; Nagatsuma, Kazuyuki; Jyomura, Sigeru; Ashida, Sakichi; and Takeuchi, Hiroshi, 4,333,842, Cl. 252-62.900.
Karino, Kimiji; Osawa, Tadao; Nagano, Masami; Sakuma, Tokihiko; Kanazawa, Yuiti; Kuroha, Tunemitu; and Tachibana, Kanji, 4,333,890, Cl. 261-41.00D.
Kashioka, Seiji; Shima, Yoshihiro; and Miyatake, Takafumi, 4,334,241, Cl. 358-107.000.
Nishizawa, Yasuo, 4,333,797, Cl. 376-210.000.
Ooki, Norihiro; Motegi, Shoji; and Watanabe, Masatoshi, 4,334,159, Cl. 310-54.000.
Sasayama, Takao; and Sakamoto, Shinichi, 4,334,186, Cl. 323-365.000.
Tada, Naofumi; Kimura, Hiroshi; and Ogata, Hisanao, 4,334,123, Cl. 174-15.00S.
Yanadori, Michio; Hasegawa, Kengo; and Uchida, Motokazu, 4,333,520, Cl. 165-59.000.
Hitachi Maxell, Ltd.: *See*—
Ishida, Osamu; Uetani, Yoshio; and Matsushima, Seiichi, 4,333,995, Cl. 429-172.000.
Hochiki Corporation: *See*—
Honma, Hiroshi, 4,333,724, Cl. 356-437.000.
Hoechst Aktiengesellschaft: *See*—
Deubel, Reinhold; Opitz, Konrad; Kruse, Hubert; Schneider, Manfred; and Uhrig, Heinz, 4,333,732, Cl. 8-527.000.
Kubbeler, Hans-Klaus; Erpenbach, Heinz; Gehrmann, Klaus; and Schmitz, Klaus, 4,333,884, Cl. 260-546.000.
Scheler, Siegfried, 4,334,004, Cl. 430-176.000.
Schmidt, Erwin, 4,334,097, Cl. 564-201.000.
Steuernagel, Hans H.; Hoyer, Ernst; and Meininger, Fritz, 4,334,076, Cl. 548-375.000.
Weithmann, Klaus U., 4,333,948, Cl. 424-285.000.
Hoffmann, Kurt; and Schulte, Heinrich, to Siemens Aktiengesellschaft. One-transistor dynamic ram with poly bit lines. 4,334,236, Cl. 357-59.000.
Hoffmann-La Roche Inc.: *See*—
Berger, Leo; and Olson, Gary L., 4,334,070, Cl. 546-70.000.
Berger, Leo; Plati, John T.; and Ziering, Albert, 4,334,078, Cl. 549-43.000.
Eberhard, Patrick; and Mindt, Wolfgang, 4,333,473, Cl. 128-635.000.
Hofling, Erich: *See*—
Bloeck, Siegfried; Hofling, Erich; Luthi, Rudolf; and Diemi, Werner, 4,333,582, Cl. 220-66.000.
Hogan, James M.; and Becht, Cletus A., to Goodyear Tire & Rubber Company, The. Method and apparatus for molding a tire. 4,333,899, Cl. 264-51.000.
Hogue Combat Grips, Inc.: *See*—
Hogue, Guy L., 4,333,256, Cl. 42-71.00P.
Hogue, Guy L., to Hogue Combat Grips, Inc. Clothes pin stirrup fastener for unitary pistol hand grip. 4,333,256, Cl. 42-71.00P.
Holbrook, Arthur J., to Rolf C. Hagen (USA) Corp. Aquarium heater. 4,333,626, Cl. 248-360.000.
Holko, Kenneth H., to General Atomic Company. Stepped transition joint. 4,333,670, Cl. 285-173.000.
Holko, Kenneth H., to General Atomic Company. Friction welded transition joint. 4,333,671, Cl. 285-173.000.
Holland, Marion D.: *See*—
Woodward, James C.; and Holland, Marion D., 4,333,205, Cl. 15-345.000.
Hollfelder, Thomas A.: *See*—
De Luca, Paul V.; Gazzo, John J.; and Hollfelder, Thomas A., 4,334,129, Cl. 179-175.110.
Holman, Danny F.: *See*—
Kocache, Riad M. A.; and Holman, Danny F., 4,333,811, Cl. 204-195.00S.
Holmberg, Carl F.: *See*—
DePaolo, James F.; Hale, Joseph T.; and Holmberg, Carl F., 4,333,271, Cl. 49-464.000.
Holmberg, Joyce D.; and Kinney, Ohler L., Jr., to Marley Company, The. Drift eliminator structure for counterflow water cooling tower. 4,333,749, Cl. 55-257.0PV.
Holmes, Jack H., to Kwik Lok Corp. Closure strip. 4,333,566, Cl. 206-343.000.
Holoubek, Verne R. Stackable tray. 4,333,573, Cl. 211-11.000.
Holowaty, Michael O.: *See*—
Bhattacharya, Debanshu; Quinto, Dennis T.; and Holowaty, Michael O., 4,333,776, Cl. 148-36.000.
Holt, Lloyd J.; and Panlaqui, Clayton E., to United States of America, Navy. Boost assisted missile launcher. 4,333,382, Cl. 89-1.806.
Holten, Ronald R.: *See*—
Vermeulen, Theodore; Grens, Edward A., II; and Holten, Ronald R., 4,333,815, Cl. 208-10.000.
Holtman, Dennis C.; and Wade, Shirley A., to Johnson & Johnson Baby Products Company. Absorbent structure containing superabsorbent. 4,333,462, Cl. 128-287.000.
Holtman, Dennis C., to Johnson & Johnson Baby Products Company. Absorbent structure containing superabsorbent. 4,333,463, Cl. 128-287.000.
Homola, Andrew M.: *See*—
Bruce, Calvin A.; Homola, Andrew M.; and Lorenz, Max R., 4,333,961, Cl. 427-13.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Iiyama, Masahiko; Sanka, Tsugio; and Naito, Kenji, 4,333,429, Cl. 123-274.000.
Mitsui, Tomiyoshi, 4,333,886, Cl. 261-18.00R.
Honeywell Information Systems Inc.: *See*—
Bourgeois, David R.; Ryan, James A.; and Varshney, Subhash C., 4,334,307, Cl. 371-16.000.
Lange, Ronald E.; and Fisher, Richard J., 4,334,289, Cl. 364-900.000.

Hong, Zuu C.: *See*—
Yang, Chiu H.; and Hong, Zuu C., 4,333,747, Cl. 55-178.000.
Honma, Hiroshi, to Hochiki Corporation. Photoelectric detector. 4,333,724, Cl. 356-437.000.
Hoover, Merle V., to RCA Corporation. Complementary symmetry FET frequency converter circuits. 4,334,324, Cl. 455-333.000.
Hoover, Troy E.: *See*—
Becker, William J.; Farber, Sheldon; and Hoover, Troy E., 4,334,072, Cl. 546-112.000.
Hoppe, Klaus; Muller, Jurgen; Keller, Jurgen; Kulbe, Bernd; Lessig, Klaus; Berlin, Christian; and Danke, Eckhard, to Veb Chemieanlagenbaukombinat Leipzig-Grimma. Mass-transfer column. 4,333,894, Cl. 261-96.000.
Hoppie, Lyle O.; and Speranza, Donald, to Eaton Corporation. Prestressed elastomer for energy storage. 4,333,553, Cl. 192-4.00A.
Horie, Seiji; and Sato, Hideo, to Fuji Photo Film Co., Ltd. Azacyanine spectra sensitized organic photoconductive compositions and elements. 4,334,001, Cl. 430-83.000.
Horng, Cheng T.; Poponiak, Michael R.; Rupprecht, Hans S.; and Schwenker, Robert O., to International Business Machines Corporation. Process for fabricating a self-aligned micrometer bipolar transistor device. 4,333,227, Cl. 29-580.000.
Horng Meei Spring Enterprise Co. Ltd.: *See*—
Wu, Hann C., 4,333,645, Cl. 272-130.000.
Hornung, Karl-Heinz: *See*—
Meyer, Klaus-Rudolf; Hornung, Karl-Heinz; Feldmann, Rainer; and Smigerski, Hans-Jurgen, 4,334,056, Cl. 528-496.000.
Horwood, Kenneth E.: *See*—
Dodson, Peter J.; and Horwood, Kenneth E., 4,333,233, Cl. 29-845.000.
Hosoe, Kazuya: *See*—
Sakane, Toshio; Hosoe, Kazuya; Tsunekawa, Tokuichi; Kinoshita, Takao; and Kawabata, Takashi, 4,333,716, Cl. 354-25.000.
Suzuki, Ryoichi; Uchiyama, Takashi; Hosoe, Kazuya; and Tsunekawa, Tokuichi, 4,334,220, Cl. 340-753.000.
House, Thomas R.: *See*—
Mulligan, William L.; and House, Thomas R., 4,333,772, Cl. 134-18.000.
Howard, Henry H.: *See*—
Flansburg, Donald G., 4,333,581, Cl. 220-20.000.
Howard, James K.: *See*—
Bhattacharyya, Arup; Chu, Wei-Kan; Howard, James K.; and Wiedman, Francis W., 4,333,808, Cl. 204-192.00D.
Howard, Marvin M. Cross scissors/shears. 4,333,235, Cl. 30-259.000.
Howden, Ashley G.: *See*—
Jones, Lawrence T.; Sims, Anson; Howden, Ashley G.; Knighton, Mark S.; Kingsbury, L. C. James; and Conroy, Richard F. M., 4,333,261, Cl. 46-257.000.
Howe, Herbert E.: *See*—
Di Martini, Carl R.; Howe, Herbert E.; Scott, William L.; and Bulvanoski, Leo J., 4,333,763, Cl. 75-77.000.
Howe, Ralph S., Jr., to Textron Inc. Antifriction bearing with removable seal means. 4,333,694, Cl. 308-187.200.
Hoxan Corporation: *See*—
Kuraoka, Yasuo, 4,333,753, Cl. 62-9.000.
Hoyer, Ernst: *See*—
Steuernagel, Hans H.; Hoyer, Ernst; and Meininger, Fritz, 4,334,076, Cl. 548-375.000.
Hrdlicka, Alois. Device for supporting a musical instrument. 4,333,378, Cl. 84-280.000.
Huber, Walter: *See*—
Bartels, Hermann; Mez, Hans-Christian; Huber, Walter; and Stolz, Hans-Peter, 4,333,356, Cl. 73-864.210.
Hufnagl, Walter; and Kotauczek, Peter. Methods and device for cladding elongated objects such as wires and the like with powdered material. 4,333,419, Cl. 118-405.000.
Hughes Aircraft Company: *See*—
Merrell, David A., 4,333,661, Cl. 277-203.000.
Hughes Tool Company: *See*—
Watkins, Bruce J., 4,333,526, Cl. 166-87.000.
Woodman, Daniel C., 4,333,528, Cl. 166-117.500.
Huling, Don W., to Boeing Company, The. Stepper motor actuated servovalve. 4,333,498, Cl. 137-625.620.
Huller Hille GmbH: *See*—
Lipp, Willi, 4,334,178, Cl. 318-572.000.
Hummel, Richard J.: *See*—
Miller, Michael E.; and Hummel, Richard J., 4,333,415, Cl. 118-16.000.
Hurtig, Carl R., to Encor Limited. Crescent wrench operating indicator. 4,333,366, Cl. 81-170.000.
Ideal Toy Corporation: *See*—
Rosenhagen, William; and Whalen, George J., 4,334,221, Cl. 340-825.720.
Idel, Karsten: *See*—
Freitag, Dieter; Reinking, Klaus; Idel, Karsten; Medem, Harald; and Bottenbruch, Ludwig, 4,334,053, Cl. 528-179.000.
Igarashi, Akira; and Matsukawa, Hiroharu, to Fuji Photo Film Co., Ltd. Heat-sensitive recording sheets. 4,333,984, Cl. 428-336.000.
Iio, Toshimitsu; and Yamaoka, Yuusaku, to Yamaha Hatsudoki Kabushiki Kaisha. Water-cooled two stroke engine having exhaust port timing control valve means. 4,333,431, Cl. 123-323.000.
Iiyama, Masahiko; Sanka, Tsugio; and Naito, Kenji, to Honda Giken Kogyo Kabushiki Kaisha. Internal combustion engine. 4,333,429, Cl. 123-274.000.
Ikeda, Tomoaki: *See*—
Kitajima, Masao; Tachikawa, Hiromichi; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,334,006, Cl. 430-254.000.
Ikeda, Yoshikazu, to Kokusai Denshin Denwa Co., Ltd. Signal processing system using a digital technique. 4,334,273, Cl. 364-484.000.
Ikin, David D.; Butler, Paul G.; Sassella, Christopher D.; and Oliver, James K., to Alcoa of Australia Limited. Heat exchanger for use with heat pipe. 4,333,525, Cl. 165-104.210.
Imazeki, Ryoji; and Yamazaki, Etsuo, to Fujitsu Fanuc Limited. Tracer control system. 4,334,272, Cl. 364-474.000.
Imazeki, Ryoji; Yamazaki, Etsuo; and Sasaki, Takao, to Fujitsu Fanuc Limited. Command generation system for generating a smooth command signal. 4,334,281, Cl. 364-723.000.
Imperial Chemical Industries Limited: *See*—
Carey, John L.; and Greenhalgh, Colin W., 4,333,877, Cl. 548-421.000.
Donaldson, Peter A., 4,334,090, Cl. 562-480.000.
Imsand, Bruce E.; and Kuehlthau, Robert L., to Intergraph Corporation. Floating coordinate system. 4,334,124, Cl. 178-19.000.
Inaba, Seiuemon; Shimajiri, Tokiji; and Toyoda, Kenichi, to A. Aoki & Associates. Index table assembly. 4,333,363, Cl. 74-826.000.
Inata, Hiroo: *See*—
Urasaki, Takanori; Hirabayashi, Yasuji; Ogasawara, Makoto; and Inata, Hiroo, 4,333,907, Cl. 264-290.200.
Inauen Machinen AG: *See*—
Grimm, Jakob, 4,333,601, Cl. 229-43.000.
Industrial Magnetics, Inc.: *See*—
Wyland, Donald J.; and Stowe, Michael W., 4,333,825, Cl. 209-223.00A.
Infotron Systems Corporation: *See*—
O'Neill, Joseph L.; and Scafidi, Christopher J., 4,333,696, Cl. 339-17.0LM.
Ingels, Luis. Ball striking game. 4,333,651, Cl. 273-129.00V.
Ingham, Donald M.: *See*—
Mueller, Wilfred; Ingham, Donald M.; and Walker, William B., 4,333,607, Cl. 239-13.000.
Ingram, Alvin R.: *See*—
Blommers, Elizabeth A.; Warfel, David R.; and Ingram, Alvin R., 4,333,970, Cl. 427-222.000.
Wright, Harold A.; and Ingram, Alvin R., 4,333,969, Cl. 427-222.000.
Inland Steel Company: *See*—
Bhattacharya, Debanshu; Quinto, Dennis T.; and Holowaty, Michael O., 4,333,776, Cl. 148-36.000.
Inmont Corporation: *See*—
Civardi, Frank P.; Sova, Stanley G.; and Getting, Milan J., 4,333,786, Cl. 156-306.600.
Inoie, Tsuguya: *See*—
Eguchi, Kouichi; and Inoie, Tsuguya, 4,334,226, Cl. 343-100.0ST.
Inoshita, Yasushi: *See*—
Shimada, Yukio; Suzuki, Naoyoshi; Ohashi, Toshio; and Inoshita, Yasushi, 4,333,606, Cl. 237-12.30A.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,333,806, Cl. 204-129.100.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Method of and apparatus for electroerosively machining a contour in a workpiece with a traveling-wire electrode. 4,333,806, Cl. 204-129.100.
Inoue, Shigeki, to Hitachi, Ltd. Stereo demodulator circuit. 4,334,125, Cl. 179-1.0GE.
Inoue, Shigeru: *See*—
Konoki, Keizo; Nobue, Michio; Fukui, Akito; and Inoue, Shigeru, 4,334,096, Cl. 564-72.000.
Inoue, Tomihiko: *See*—
Sugiura, Taku; Fukuoka, Katsuya; Inoue, Tomihiko; Kanbe, Masayoshi; and Iwama, Toshio, 4,333,512, Cl. 164-453.000.
Institute of Gas Technology: *See*—
Chynoweth, David P.; and Tarman, Paul B., 4,334,026, Cl. 435-163.000.
Intergraph Corporation: *See*—
Imsand, Bruce E.; and Kuehlthau, Robert L., 4,334,124, Cl. 178-19.000.
International Business Machines Corporation: *See*—
Bannon, Robert D.; and Bhansali, Mahendra M., 4,334,309, Cl. 371-38.000.
Beyer, Klaus D.; and Logan, Joseph S., 4,333,794, Cl. 156-648.000.
Bhattacharyya, Arup; Chu, Wei-Kan; Howard, James K.; and Wiedman, Francis W., 4,333,808, Cl. 204-192.00D.
Bohlen, Harald; Engelke, Helmut; Kulcke, Werner; Nehmiz, Peter; and Greschner, Johann, 4,334,156, Cl. 250-491.000.
Bruce, Calvin A.; Homola, Andrew M.; and Lorenz, Max R., 4,333,961, Cl. 427-13.000.
Davidge, Ronald V.; Queener, Carl A.; and Vanderslice, James T., 4,333,639, Cl. 271-3.100.
Faris, Sadeg M., 4,334,158, Cl. 307-462.000.
Heuber, Klaus; and Wiedmann, Siegfried K., 4,334,294, Cl. 365-203.000.
Horng, Cheng T.; Poponiak, Michael R.; Rupprecht, Hans S.; and Schwenker, Robert O., 4,333,227, Cl. 29-580.000.
Kerigan, Shaun C.; Key, Brian D.; and Smith, James, 4,334,286, Cl. 364-900.000.
Kotecha, Harish N., 4,334,292, Cl. 365-182.000.
Maley, Gerald A., 4,334,310, Cl. 371-64.000.
Regehr, John L., 4,334,231, Cl. 346-35.000.
International Flavors & Fragrances Inc.: *See*—
Boden, Richard M., 4,333,481, Cl. 131-276.000.

Mookherjee, Braja D.; Trenkle, Robert W.; Wilson, Richard A.; Schmitt, Frederick L.; Vock, Manfred H.; Granda, Edward J.; Vinals, Joaquin; Kiwala, Jacob; and Schreiber, William L., 4,334,098, Cl. 568-347.000.

International Harvester Company: *See*—
De Jong, Donald W., 4,333,871, Cl. 260-112.00R.
Weisman, Roland E., 4,333,251, Cl. 37-118.00R.

International Telephone and Telegraph Corporation: *See*—
Anhalt, John W.; and Muzslay, Steven Z., 4,333,703, Cl. 339-217.00S.

International Water Saving Systems, Inc.: *See*—
Heinze, Walter O.; and Tufts, Wesley M., 4,333,185, Cl. 4-319.000.

Iser, George H. Space case drummers throne combination. 4,333,682, Cl. 297-192.000.

Iseya, Shigeo; and Utagawa, Giichi, to Asahi Seimitsu Kabushiki Kaisha. Head supporting device for universal parallel ruler. 4,333,245, Cl. 33-438.000.

Ishida, Osamu; Uetani, Yoshio; and Matsushima, Seiichi, to Hitachi Maxell, Ltd. Leak proof cells provided with a synthetic resin gasket having an increased degree of crystallinity. 4,333,995, Cl. 429-172.000.

Ishida, Toshihiko; and Tanaka, Kimio, to TDK Electronics Co., Ltd. Tape cassette. 4,333,620, Cl. 242-199.000.

Ishiguro, Shoji: *See*—
Mifune, Hiroyuki; Ishiguro, Shoji; Shishido, Tadao; Fuseya, Yoshiharu; and Tsujikawa, Teruaki, 4,334,010, Cl. 430-551.000.
Mifune, Hiroyuki; Shishido, Tadao; Ishiguro, Shoji; and Ueyanagi, Jisaburo, 4,334,014, Cl. 430-611.000.

Ishihara, Masami: *See*—
Abe, Koichi; Ishihara, Masami; and Watanabe, Thuyoshi, 4,334,080, Cl. 560-99.000.

Ishii, Makoto: *See*—
Oomura, Etsuji; Murotani, Toshio; and Ishii, Makoto, 4,334,311, Cl. 372-47.000.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Takeuchi, Osamu; Aoki, Kiyoshi; and Fujii, Yuichi, 4,333,777, Cl. 148-128.000.

Ito, Osamu: *See*—
Komurasaki, Satoshi; Watanabe, Isao; and Ito, Osamu, 4,334,299, Cl. 369-44.000.

Ito, Yukio; Nagatsuma, Kazuyuki; Jyomura, Sigeru; Ashida, Sakichi; and Takeuchi, Hiroshi, to Hitachi, Ltd. Piezoelectric single crystal and surface acoustic wave element employing the same. 4,333,842, Cl. 252-62.900.

Itoh, Ryouichi: *See*—
Hayashi, Tatsuo; Itoh, Ryouichi; and Tsuji, Tatsumi, 4,333,897, Cl. 264-40.600.

Itoh, Takayuki; Ogawa, Ryota; and Arai, Yasunori, to Asahi Kogaku Kogyo Kabushiki Kaisha. Zoom lens for copying. 4,333,711, Cl. 350-426.000.

Ittner, Nelson C.; and Rooke, William I., to Alloy Spot Welders, Inc. Method of brazing honeycomb and panel assemblies. 4,333,598, Cl. 228-181.000.

Iwai, Tadashi; Kawahito, Takashi; and Tokuse, Masahiro, to UBE Industries, Ltd. Process for producing metallic carbonitride. 4,333,915, Cl. 423-324.000.

Iwai, Tadashi; Kawahito, Takashi; and Tokuse, Masahiro, to UBE Industries, Ltd. Process for producing carbonitride of metal. 4,333,916, Cl. 423-371.000.

Iwama, Toshio: *See*—
Sugiura, Taku; Fukuoka, Katsuya; Inoue, Tomihiko; Kanbe, Masayoshi; and Iwama, Toshio, 4,333,512, Cl. 164-453.000.

Iwamura, Seiji; and Tanaka, Hiromi, to Sumitomo Heavy Industries, Ltd. Multi-stage moving bed type adsorption device. 4,333,751, Cl. 55-390.000.

Iwata, Koichi: *See*—
Agui, Takesi; Nakajima, Masayuki; and Iwata, Koichi, 4,334,274, Cl. 364-515.000.

Izod, Thomas P. J.: *See*—
Abrahams, Louis; and Izod, Thomas P. J., 4,333,977, Cl. 428-131.000.

Izumi, Masao, to Nissan Motor Company, Limited. Protection device for a vehicle-mounted air conditioner compressor. 4,334,255, Cl. 361-22.000.

J. R. Schneider Co., Inc.: *See*—
Cardoza, Richard E.; and Crowe, William D., 4,333,839, Cl. 210-777.000.

Jackson, Edgar D., to Steel Web Corporation. Joist having differing metal web reinforcement. 4,333,293, Cl. 52-692.000.

Jacob, Theodore A.: *See*—
Buhs, Rudolf P.; Jacob, Theodore A.; Miwa, Gerald; Sestokas, Elena; Taub, Rae; and Walsh, John S., 4,333,925, Cl. 424-181.000.

Jakobsen, Kjell M., to PLM AB. Forming a mouthpiece on a preform. 4,333,904, Cl. 264-323.000.

Jamestown Metal Mfg. Corp.: *See*—
Robbins, James M., 4,333,556, Cl. 194-92.000.

Janda, George M., to GTE Automatic Electric Labs Inc. Identification cap actuator assembly. 4,334,134, Cl. 200-314.000.

Janke, Bernhard, to HEF-Fenstertechnik Vetriebs GmbH. Casement frame. 4,333,295, Cl. 52-730.000.

Japan Radio Company, Limited: *See*—
Eguchi, Kouichi; and Inoie, Tsuguya, 4,334,226, Cl. 343-100.0ST.

Japan Synthetic Rubber Co., Ltd.: *See*—
Kotani, Teizo; Takemura, Yasuhiko; and Miyabayashi, Toshio, 4,334,044, Cl. 525-379.000.

Jauchen, Peter: *See*—
Muller, Heinz; Jauchen, Peter; Szonn, Bodo; and Schulze, Rolf, 4,333,449, Cl. 128-155.000.

Jaworski, Eugene; Disko, Harry; and Breslow, Jeffrey D., to Marvin Glass & Associates. Electronic dart game. 4,333,657, Cl. 273-376.000.

JCM Industries, Inc.: *See*—
Morriss, James C., Jr., 4,334,140, Cl. 219-127.000.

Jeffcoat, Keith W.; and Wickham, Geoffrey G., to Telectronics Pty. Ltd. Bone growth stimulator. 4,333,469, Cl. 128-419.00F.

Jensen, Alice, executor: *See*—
Jensen, Harald W., deceased; and Jensen, Christen V., 4,333,188, Cl. 4-514.000.

Jensen, Christen V.: *See*—
Jensen, Harald W., deceased; and Jensen, Christen V., 4,333,188, Cl. 4-514.000.

Jensen, Harald W., deceased (by Jensen, Alice, executor); and Jensen, Christen V., to Stainless Steel Sinks, Inc. Convertible sink. 4,333,188, Cl. 4-514.000.

Jitsumatsu, Yuuji: *See*—
Satou, Shun; and Jitsumatsu, Yuuji, 4,334,214, Cl. 340-552.000.

Johal, Sarjit. Preparation and crystallization of fraction I protein from plant sources. 4,334,024, Cl. 435-232.000.

Johansson, Gustav I. Climbing device for vehicles. 4,333,547, Cl. 182-90.000.

Johns, Robert H. Bifilar antenna trap. 4,334,228, Cl. 343-722.000.

Johnson & Johnson Baby Products Company: *See*—
Holtman, Dennis C.; and Wade, Shirley A., 4,333,462, Cl. 128-287.000.
Holtman, Dennis C., 4,333,463, Cl. 128-287.000.
Pieniak, Heinz A., 4,333,782, Cl. 156-164.000.

Johnson, Porter C.; and Matier, William L., to Mead Johnson & Company. 2-Alkynyl-5-indanyloxyacetic acids. 4,334,088, Cl. 562-462.000.

Johnson, Steven A. Solar energy absorber apparatus and method. 4,333,448, Cl. 126-452.000.

Johnston, David R. Window insulations. 4,333,511, Cl. 160-267.00R.

Johnston, Thomas J.: *See*—
Kaplan, Howard I.; Bryce, Jerry H.; Johnston, Thomas J.; McMinn, Curtis J.; Willett, John T.; and Richards, Nolan E., 4,333,813, Cl. 204-243.00R.

Jokisch, Friedrich: *See*—
Lorrek, Johannes; and Jokisch, Friedrich, 4,333,910, Cl. 422-228.000.

Jones, Lawrence T.; Sims, Anson; Howden, Ashley G.; Knighton, Mark S.; Kingsbury, L. C. James; and Conroy, Richard F. M., to California R & D Center. Two speed toy car and track assembly. 4,333,261, Cl. 46-257.000.

Jones, Sterling W. Weight driven rotary power generating apparatus. 4,333,548, Cl. 185-33.000.

Jones, Thomas H., to Richardson Graphics Company. Ultra high speed presensitized lithographic plates. 4,334,003, Cl. 430-156.000.

Jones, William D. Pipe seal. 4,333,662, Cl. 277-207.00A.

Jones, William L.; and Christensen, Jon A., to Baxter Travenol Laboratories, Inc. Clamp for preventing the unintentional separation of a conduit from a container. 4,333,505, Cl. 141-383.000.

Josef Uhlmann Maschinenfabrik GmbH & Co. KG: *See*—
Kuttenbaum, Valentin; and Henle, Ernst, 4,333,297, Cl. 53-252.000.

Juengst, Fred W., Jr.; and Dika, John A., to Calor Agriculture Research, Inc. Calcium ammonium lactate and solidified fermented ammoniated condensed whey. 4,333,956, Cl. 426-69.000.

Jujo Patper Co., Ltd.: *See*—
Yamato, Noboru; and Satake, Tosimi, 4,333,990, Cl. 428-531.000.

Jyomura, Sigeru: *See*—
Ito, Yukio; Nagatsuma, Kazuyuki; Jyomura, Sigeru; Ashida, Sakichi; and Takeuchi, Hiroshi, 4,333,842, Cl. 252-62.900.

Kabel und Metallwerke Gutehoffnungshutte A.G.: *See*—
Schmidtchen, Hans-Martin, 4,333,898, Cl. 264-45.900.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Morikawa, Minoru; Kokubu, Sadao; and Hirai, Tadashi, 4,333,325, Cl. 70-186.000.

Kahn, David A.: *See*—
Dakin, John P.; and Kahn, David A., 4,334,152, Cl. 250-226.000.

Kaim, John W., to Amsted Industries Incorporated. Carrier assembly for use with a rotary railroad coupler system. 4,333,576, Cl. 213-61.000.

Kajima Kensetsu Kabushiki Kaisha: *See*—
Koizumi, Hajime; Toyama, Kozo; Kobayashi, Mikio; Hatano, Hajime; Saeki, Toshio; Mizukoshi, Kaoru; Tamanaga, Shinichi; Miyakawa, Keizo; and Kato, Tomoyasu, 4,333,285, Cl. 52-252.000.

Kalopissis, Gregoire: *See*—
Bugaut, Andree; Shahin, Majdi M.; Vandenbossche, Jean-Jacques H.; and Kalopissis, Gregoire, 4,333,730, Cl. 8-407.000.

Kamioka, Hajime, to Fujitsu Limited. Method for producing walled emitter type bipolar transistors. 4,333,774, Cl. 148-1.500.

Kampe, Andrew J., to Raychem Corporation. PTC Heaters. 4,334,148, Cl. 219-553.000.

Kamrath, Richard P.: *See*—
Rudell, Elliot A.; Cernansky, Joseph S.; and Kamrath, Richard P., 4,333,655, Cl. 273-241.000.

Kanai, Hiroyuki: *See*—
Yamashita, Fumio; and Kurobe, Hideharu, 4,333,306, Cl. 57-206.000.

Kanamaru, Hitoshi, to Pioneer Electronic Corporation. Optical reading apparatus with scanner light intensity control. 4,334,301, Cl. 369-116.000.

Kanaya, Yoshihiro: *See*—
Takagi, Hidehiko; Hayashi, Hisao; Ogawa, Kazuo; and Kanaya, Yoshihiro, 4,334,137, Cl. 219-10.55F.
Kanazawa, Yuiti: *See*—
Karino, Kimiji; Osawa, Tadao; Nagano, Masami; Sakuma, Tokihiko; Kanazawa, Yuiti; Kuroha, Tunemitu; and Tachibana, Kanji, 4,333,890, Cl. 261-41.00D.
Kanbe, Masayoshi: *See*—
Sugiura, Taku; Fukuoka, Katsuya; Inoue, Tomihiko; Kanbe, Masayoshi; and Iwama, Toshio, 4,333,512, Cl. 164-453.000.
Kando, Toru: *See*—
Takami, Satoshi; Hagiwara, Teruo; Kando, Toru; and Kuroki, Yoshifumi, 4,333,719, Cl. 354-132.000.
Kane, Johji, to Matsushita Electric Industrial Co. Ltd. Directivity-controllable antenna system. 4,334,230, Cl. 343-797.000.
Kanebo Foods, Ltd.: *See*—
Murata, Susumu; Shimizu, Noriyuki; and Kokeguchi, Sadao, 4,333,955, Cl. 426-44.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Yonezawa, Kazuya; Furukawa, Hisao; and Azuma, Masaaki, 4,334,036, Cl. 525-102.000.
Kanto Kasei Kogyo Kabushiki Kaisha: *See*—
Miyahara, Nobufumi; and Uchida, Takashi, 4,334,166, Cl. 310-268.000.
Kaplan, Howard I.; Bryce, Jerry H.; Johnston, Thomas J.; McMinn, Curtis J.; Willett, John T.; and Richards, Nolan E., to Reynolds Metals Company. Cathodes for alumina reduction cells. 4,333,813, Cl. 204-243.00R.
Karino, Kimiji; Osawa, Tadao; Nagano, Masami; Sakuma, Tokihiko; Kanazawa, Yuiti; Kuroha, Tunemitu; and Tachibana, Kanji, to Hitachi, Ltd. Slow fuel controlling device for carburetor. 4,333,890, Cl. 261-41.00D.
Karjalainen, Arto J.; and Kurkela, Kauko O. A., to Farmos-Yhtyma Oy. Substituted imidazoles and their use. 4,333,947, Cl. 424-273.00R.
Karlsson, Tom O. B.; and Larsson, Hans M., to Nordnero AB. Water-based cleaning system. 4,333,485, Cl. 134-60.000.
Karm, Robert, to Martel Catala & Cie. Forming fabrics for paper-making machines and methods of manufacture thereof. 4,333,502, Cl. 139-425.00A.
Kashioka, Seiji; Shima, Yoshihiro; and Miyatake, Takafumi, to Hitachi, Ltd. Pattern position detecting system. 4,334,241, Cl. 358-107.000.
Katagi, Kazuo, to Sperry Corporation. Median detector. 4,334,223, Cl. 343-5.00W.
Kato, Kazuo: *See*—
Ohno, Sachio; Nagasaka, Mitsuaki; and Kato, Kazuo, 4,334,067, Cl. 544-151.000.
Kato, Tomoyasu: *See*—
Koizumi, Hajime; Toyama, Kozo; Kobayashi, Mikio; Hatano, Hajime; Saeki, Toshio; Mizukoshi, Kaoru; Tamanaga, Shinichi; Miyakawa, Keizo; and Kato, Tomoyasu, 4,333,285, Cl. 52-252.000.
Kato, Toshikazu: *See*—
Motoyama, Kazuyasu; and Kato, Toshikazu, 4,334,253, Cl. 360-137.000.
Katz, Thomas J.; Nair, Mridula; and Lee, Steven J., to United States of America, Navy. Olefin metathesis. 4,334,048, Cl. 526-170.000.
Kawabata, Takashi: *See*—
Sakane, Toshio; Hosoe, Kazuya; Tsunekawa, Tokuichi; Kinoshita, Takao; and Kawabata, Takashi, 4,333,716, Cl. 354-25.000.
Kawahito, Takashi: *See*—
Iwai, Tadashi; Kawahito, Takashi; and Tokuse, Masahiro, 4,333,915, Cl. 423-324.000.
Iwai, Tadashi; Kawahito, Takashi; and Tokuse, Masahiro, 4,333,916, Cl. 423-371.000.
Kawakita, Kenji; Makino, Takenori; and Harada, Norio, to Nippon Electric Co., Ltd. Divider for calculating by summation the quotient and remainder of an integer divided by a Mersenne number and a parallel processor system comprising memory modules, a Mersenne prime in number. 4,334,285, Cl. 364-761.000.
Keefe, Tom; and Rosellini, Bruno, to Grant Industries Incorporated. Slide mechanism. 4,333,690, Cl. 308-3.800.
Keller, Jurgen: *See*—
Hoppe, Klaus; Muller, Jurgen; Keller, Jurgen; Kulbe, Bernd; Lessig, Klaus; Berlin, Christian; and Danke, Eckhard, 4,333,894, Cl. 261-96.000.
Kelley, Michael R.; Emfinger, Jack E.; and Dassele, Michael A., to Sperry Corporation. Optical selector switch and display apparatus. 4,334,222, Cl. 340-870.290.
Kendall Company, The: *See*—
Villari, Frank K.; and Cianci, James P., 4,333,480, Cl. 128-767.000.
Kennametal Inc.: *See*—
Barnstorf, Ingo, 4,333,687, Cl. 299-81.000.
Kerigan, Shaun C.; Key, Brian D.; and Smith, James, to International Business Machines Corporation. Data entry apparatus for entering tabular data row by row and column by column. 4,334,286, Cl. 364-900.000.
Keritsis, Gus D., to Philip Morris Incorporated. Modified cellulosic smoking material and method for its preparation. 4,333,484. Cl. 131-359.000.
Kerr, Ada Margery: *See*—
Kerr, Kenneth G., 4,333,673, Cl. 292-59.000.
Kerr, Alan Gordon: *See*—
Kerr, Kenneth G., 4,333,673, Cl. 292-59.000.
Kerr, Bruce Kenneth: *See*—
Kerr, Kenneth G., 4,333,673, Cl. 292-59.000.
Kerr, Colin Frederick: *See*—
Kerr, Kenneth G., 4,333,673, Cl. 292-59.000.
Kerr, Keith Edward: *See*—
Kerr, Kenneth G., 4,333,673, Cl. 292-59.000.
Kerr, Kenneth G., to Kerr, Ada Margery; Kerr, Alan Gordon; Kerr, Keith Edward; Kerr, Bruce Kenneth; and Kerr, Colin Frederick. Gate latch. 4,333,673, Cl. 292-59.000.
Kesting, Robert E., to Puropore, Inc. Highly anisotropic membranes. 4,333,972, Cl. 427-244.000.
Key, Brian D.: *See*—
Kerigan, Shaun C.; Key, Brian D.; and Smith, James, 4,334,286, Cl. 364-900.000.
Keystone Consolidated Industries, Inc.: *See*—
Geisler, Robert C., 4,333,628, Cl. 248-551.000.
Kigre, Inc.: *See*—
Myers, John D.; and Vollers, Charles S., 4,333,848, Cl. 252-301.40P.
Kikkawa, Kazutoshi: *See*—
Shimizu, Yasuo; Takao, Hisashi; Asano, Shoji; Shimada, Shuya; and Kikkawa, Kazutoshi, 4,334,066, Cl. 544-149.000.
Kikuchi, Kazuhiro: *See*—
Nakajima, Yasuo; and Kikuchi, Kazuhiro, 4,333,334, Cl. 73-35.000.
Kimberly-Clark Corporation: *See*—
Matthews, Billie J., 4,333,466, Cl. 128-290.00R.
Sciaraffa, Michael A.; Thome, David G.; and Vogt, Clifford M., 4,333,979, Cl. 428-179.000.
Kimura, Akira. Solar powered toy. 4,333,262, Cl. 46-266.000.
Kimura, Hiroshi: *See*—
Tada, Naofumi; Kimura, Hiroshi; and Ogata, Hisanao, 4,334,123, Cl. 174-15.00S.
Kimura, Kitsuhiro: *See*—
Nishizawa, Jun-Ichi; and Kimura, Kitsuhiro, 4,333,989, Cl. 428-446.000.
Kingsbury, L. C. James: *See*—
Jones, Lawrence T.; Sims, Anson; Howden, Ashley G.; Knighton, Mark S.; Kingsbury, L. C. James; and Conroy, Richard F. M., 4,333,261, Cl. 46-257.000.
Kinney, Ohler L., Jr.: *See*—
Holmberg, Joyce D.; and Kinney, Ohler L., Jr., 4,333,749, Cl. 55-257.0PV.
Kinoshita, Takao: *See*—
Sakane, Toshio; Hosoe, Kazuya; Tsunekawa, Tokuichi; Kinoshita, Takao; and Kawabata, Takashi, 4,333,716, Cl. 354-25.000.
Kirchhof, Bruno, to Boehringer Mannheim GmbH. Process and reagent for the determination of prothrombin. 4,334,018, Cl. 435-13.000.
Kirchmayr, Rudolf: *See*—
Schmidt, Andreas; Kirchmayr, Rudolf; and Randell, Donald R., 4,333,841, Cl. 252-32.70E.
Kirk Chemicals: *See*—
Trzecieski, Jan, 4,333,953, Cl. 426-34.000.
Trzecieski, Jan, 4,333,954, Cl. 426-41.000.
Kitabayashi, Siichi. Wave energy converting device. 4,333,311, Cl. 60-496.000.
Kitajima, Masao; Tachikawa, Hiromichi; Shinozaki, Fumiaki; and Ikeda, Tomoaki, to Fuji Photo Film Co., Ltd. Peel-apart process for forming relief images. 4,334,006, Cl. 430-254.000.
Kitamoto, Tatsuji: *See*—
Shirahata, Ryuji; Yanai, Akio; and Kitamoto, Tatsuji, 4,333,985, Cl. 428-336.000.
Yamada, Yasuyuki; Masuyama, Kenichi; and Kitamoto, Tatsuji, 4,333,988, Cl. 428-425.900.
Kiwala, Jacob: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Wilson, Richard A.; Schmitt, Frederick L.; Vock, Manfred H.; Granda, Edward J.; Vinals, Joaquin; Kiwala, Jacob; and Schreiber, William L., 4,334,098, Cl. 568-347.000.
Klank, Otto; and Wahling, Wilfried, to Licentia Patent-Verwaltungs-G.m.b.H. Broadcast receiver tuning circuit. 4,334,318, Cl. 455-195.000.
Kleber, John W.; and Simpson, Barbara E., to Eli Lilly and Company. Growth promotant controlled release formulations and method of treatment. 4,333,919, Cl. 424-15.000.
Klein, Joachim; and Wagner, Fritz. Preparation of immobilized enzymatically-active substance. 4,334,027, Cl. 435-178.000.
Kleiner, Fredric: *See*—
Zemelman, Valery B.; Kleiner, Fredric; and Kuchman, Michael J., 4,333,315, Cl. 62-1.000.
Kley, Hans-Peter: *See*—
Eistetter, Klaus; Kley, Hans-Peter; Menge, Heinz-Gunter; and Schaefer, Hartmann, 4,333,942, Cl. 424-267.000.
Kleykamp, Donald L., to Dayco Corporation. Reinforced railway pedestal liner. 4,333,404, Cl. 105-225.000.
Klose, Karl W., to Cooper Tire & Rubber Company. Tire building machine servicer. 4,333,788, Cl. 156-405.00R.
Kluczynski, Achim; and Altmann, Erik, to AGFA-Gevaert AG. Film cassette for roll films. 4,333,615, Cl. 242-71.100.
Knarr, John J.: *See*—
Hardy, James E.; and Knarr, John J., 4,333,735, Cl. 23-232.00R.
Knifton, John F., to Texaco Inc. Method of preparing aliphatic carboxylic acids. 4,334,092, Cl. 562-517.000.
Knifton, John F., to Texaco, Inc. Method of preparing aliphatic carboxylic acids. 4,334,093, Cl. 562-517.000.
Knifton, John F., to Texaco Inc. Method of preparing aliphatic carboxylic acids. 4,334,094, Cl. 562-517.000.

Knighton, Mark S.: *See—*
Jones, Lawrence T.; Sims, Anson; Howden, Ashley G.; Knighton, Mark S.; Kingsbury, L. C. James; and Conroy, Richard F. M., 4,333,261, Cl. 46-257.000.

Knubley, John S. Air dispensing apparatus. 4,333,491, Cl. 137-116.300.

Knudsen, Lars, to ASEA Aktiebolag. High voltage direct current transmission apparatus. 4,334,264, Cl. 363-51.000.

Kobayashi, Masayoshi; Sakuranaka, Toru; and Nakagawa, Sachio, to Diesel Kiki Company, Ltd. Fuel injection pump. 4,333,432, Cl. 123-366.000.

Kobayashi, Mikio: *See—*
Koizumi, Hajime; Toyama, Kozo; Kobayashi, Mikio; Hatano, Hajime; Saeki, Toshio; Mizukoshi, Kaoru; Tamanaga, Shinichi; Miyakawa, Keizo; and Kato, Tomoyasu, 4,333,285, Cl. 52-252.000.

Koberstein, Michael V., to Arizona Diversified Products, Inc. Structural member for installation system. 4,333,290, Cl. 52-376.000.

Kobylinski, Thaddeus P.: *See—*
Pellegrini, John P., Jr.; Beach, David L.; and Kobylinski, Thaddeus P., 4,334,113, Cl. 585-18.000.

Kocache, Riad M. A.; and Holman, Danny F., to Sybron Corporation. Device for monitoring a component in a fluid mixture. 4,333,811, Cl. 204-195.00S.

Koch, Alfred, to BBC Brown, Boveri & Company, Limited. Method for producing a super-conductive coil and coil produced in accordance with this method. 4,333,228, Cl. 29-599.000.

Kochanowski, John E., to General Electric Company. Thermoplastic foamable blends. 4,334,030, Cl. 521-90.000.

Kocher, Walter. Method and apparatus for producing a composite material having ultrasonically welded seams which confine strands. 4,333,978, Cl. 428-158.000.

Koelmel, Carl F.: *See—*
Lovas, Joseph R.; Lovas, Paul J.; and Koelmel, Carl F., 4,333,236, Cl. 30-380.000.

Kohlmann, Wilhelm: *See—*
Scharwaechter, Peter; Gutsche, Klaus; Kohlmann, Wilhelm; Kroemer, Gerhard, deceased; Kroemer, Norma, legal representative; Kroemer, Helmut, legal representative; and Kroemer, Maria M., legal representative, 4,333,936, Cl. 424-251.000.

Koizumi, Hajime; Toyama, Kozo; Kobayashi, Mikio; Hatano, Hajime; Saeki, Toshio; Mizukoshi, Kaoru; Tamanaga, Shinichi; Miyakawa, Keizo; and Kato, Tomoyasu, to Kajima Kensetsu Kabushiki Kaisha. Building structure. 4,333,285, Cl. 52-252.000.

Kojima, Ichiro; Maruhashi, Kenji; and Fujiwara, Yasuo, to Nippon Oil Company, Ltd. Process for producing coproporphyrin III. 4,334,021, Cl. 435-118.000.

Kokeguchi, Sadao: *See—*
Murata, Susumu; Shimizu, Noriyuki; and Kokeguchi, Sadao, 4,333,955, Cl. 426-44.000.

Kokosinski, Jacek: *See—*
Przyluski, Jan; Madry, Kazimierz; Dolecki, Zbigniew; Kotarski, Andrzej; Drygas, Maria; Kokosinski, Jacek; Kuzma, Zygmunt; and Chelminski, Bohdan, 4,333,802, Cl. 204-54.00R.

Kokot, Hellmut: *See—*
Kolling, Georg; Romey, Ingo; and Kokot, Hellmut, 4,333,816, Cl. 208-91.000.

Kokubu, Sadao: *See—*
Morikawa, Minoru; Kokubu, Sadao; and Hirai, Tadashi, 4,333,325, Cl. 70-186.000.

Kokusai Denshin Denwa Co., Ltd.: *See—*
Ikeda, Yoshikazu, 4,334,273, Cl. 364-484.000.

Kolling, Georg; Romey, Ingo; and Kokot, Hellmut, to Bergwerksverband GmbH. Method for the production of needle coke. 4,333,816, Cl. 208-91.000.

Kollmorgen Technologies Corporation: *See—*
Watt, Gordon J., 4,333,368, Cl. 82-1.00C.

Komurasaki, Satoshi; Watanabe, Isao; and Ito, Osamu, to Mitsubishi Denki Kabushiki Kaisha. Optical signal recording and reproducing system. 4,334,299, Cl. 369-44.000.

Konig, Joachim; and Suling, Carlhans, to Bayer Aktiengesellschaft. Production of copolymers of acrylonitrile and vinyl chloride. 4,334,046, Cl. 526-93.000.

Konoki, Keizo; Nobue, Michio; Fukui, Akito; and Inoue, Shigeru, to Toyo Engineering Corporation; and Mitsui Toatsu Chemicals, Inc. Process for synthesizing urea. 4,334,096, Cl. 564-72.000.

Kopia Kabushiki Kaisha: *See—*
Agui, Takesi; Nakajima, Masayuki; and Iwata, Koichi, 4,334,274, Cl. 364-515.000.

Kopse, Odon; and Ziesche, Kurt, to Robert Bosch GmbH. Servo operated injection nozzle-pump combination with controlled rate of servo pressure change. 4,333,436, Cl. 123-502.000.

Koshigoe, Shinpei: *See—*
Takenaka, Shigeo; Hamano, Eizaburou; and Koshigoe, Shinpei, 4,334,169, Cl. 313-414.000.

Kotani, Teizo; Takemura, Yasuhiko; and Miyabayashi, Toshio, to Japan Synthetic Rubber Co., Ltd. Diene rubber having anti-deteriorating function and process for production thereof. 4,334,044, Cl. 525-379.000.

Kotarski, Andrzej: *See—*
Przyluski, Jan; Madry, Kazimierz; Dolecki, Zbigniew; Kotarski, Andrzej; Drygas, Maria; Kokosinski, Jacek; Kuzma, Zygmunt; and Chelminski, Bohdan, 4,333,802, Cl. 204-54.00R.

Kotauczek, Peter: *See—*
Hufnagl, Walter; and Kotauczek, Peter, 4,333,419, Cl. 118-405.000.

Kotecha, Harish N., to International Business Machines Corp. Low voltage electrically erasable programmable read only memory. 4,334,292, Cl. 365-182.000.

Kotick, Michael P.; and Polazzi, Joseph O., to Miles Laboratories, Inc. 17-Cyclobutylmethyl-3-hydroxy-8β-methyl-6-methylene-morphinane methanesulfonate. 4,334,071, Cl. 546-74.000.

Koukal, Anton. Follow-up control means in swinging-arm flame-cutting machines. 4,333,635, Cl. 266-64.000.

Koutonen, Pauli; and Alanco, Lars-Erik, to Oy Wartsila AB. Roll wrapping arrangement. 4,333,301, Cl. 53-587.000.

Koyama, Kenji; Ohno, Syotaro; and Fukuda, Mitsutoshi, to Toyo Soda Manufacturing Co., Ltd. Process for separating γ-globulin aggregate by polysulfone membrane. 4,333,870, Cl. 260-112.00B.

Kozak, George M. Solid state slug rejector. 4,333,557, Cl. 194-97.00A.

Kozlowski, Peter F., to A. W. Chesterton Company. Method for making braided packing. 4,333,380, Cl. 87-6.000.

Krass, Ekkehard; and Wolf, Horst, to Byk Gulden Lomberg Chemische Fabrik Gesellschaft. Substituted oxocarboxylic acids, processes for their preparation, their use and medicaments containing them. 4,334,089, Cl. 562-463.000.

Kraus, Charles E., to Excelermatic Inc. Hydrostatic axial thrust bearing. 4,333,692, Cl. 308-9.000.

Krautkramer-Branson, Inc.: *See—*
Renzel, Peter; and Kroesen, Klaus, 4,333,345, Cl. 73-606.000.
Renzel, Peter, 4,333,346, Cl. 73-606.000.

Kreiter, Heinz: *See—*
Muylle, Wilfried E.; and Kreiter, Heinz, 4,333,372, Cl. 83-324.000.

Kreitzer, Melvyn H., to Vivitar Corporation. Compact wide angle lens. 4,333,714, Cl. 350-460.000.

Krieg, Karl, to C.A. Greiner & Sohne GmbH & Co. KG. Blood extraction instrument. 4,333,478, Cl. 128-764.000.

Kroemer, Gerhard, deceased: *See—*
Scharwaechter, Peter; Gutsche, Klaus; Kohlmann, Wilhelm; Kroemer, Gerhard, deceased; Kroemer, Norma, legal representative; Kroemer, Helmut, legal representative; and Kroemer, Maria M., legal representative, 4,333,936, Cl. 424-251.000.

Kroemer, Helmut, legal representative: *See—*
Scharwaechter, Peter; Gutsche, Klaus; Kohlmann, Wilhelm; Kroemer, Gerhard, deceased; Kroemer, Norma, legal representative; Kroemer, Helmut, legal representative; and Kroemer, Maria M., legal representative, 4,333,936, Cl. 424-251.000.

Kroemer, Maria M., legal representative: *See—*
Scharwaechter, Peter; Gutsche, Klaus; Kohlmann, Wilhelm; Kroemer, Gerhard, deceased; Kroemer, Norma, legal representative; Kroemer, Helmut, legal representative; and Kroemer, Maria M., legal representative, 4,333,936, Cl. 424-251.000.

Kroemer, Norma, legal representative: *See—*
Scharwaechter, Peter; Gutsche, Klaus; Kohlmann, Wilhelm; Kroemer, Gerhard, deceased; Kroemer, Norma, legal representative; Kroemer, Helmut, legal representative; and Kroemer, Maria M., legal representative, 4,333,936, Cl. 424-251.000.

Kroesen, Klaus: *See—*
Renzel, Peter; and Kroesen, Klaus, 4,333,345, Cl. 73-606.000.

Krueger, Robert H.; Albertson, Clarence E.; and Miglin, Bruce P., to Borg-Warner Corporation. Corrodible container for automatic addition of corrosion inhibitor to a coolant system. 4,333,516, Cl. 165-1.000.

Krueger, Robert H., to Borg-Warner Corporation. Filled polymer composition for automatic addition of a corrosion inhibitor to a coolant system. 4,333,850, Cl. 252-389.00A.

Krupa, Andrew S.: *See—*
Velenyi, Louis J.; and Krupa, Andrew S., 4,334,116, Cl. 585-440.000.

Krupp-Koppers GmbH: *See—*
Lorrek, Johannes; and Jokisch, Friedrich, 4,333,910, Cl. 422-228.000.

Kruse, Hubert: *See—*
Deubel, Reinhold; Opitz, Konrad; Kruse, Hubert; Schneider, Manfred; and Uhrig, Heinz, 4,333,732, Cl. 8-527.000.

Kubbeler, Hans-Klaus; Erpenbach, Heinz; Gehrmann, Klaus; and Schmitz, Klaus, to Hoechst Aktiengesellschaft. Production of acetic anhydride. 4,333,884, Cl. 260-546.000.

Kubo, Akira: *See—*
Suzuki, Tameyuki; and Kubo, Akira, 4,333,807, Cl. 204-181.00T.

Kuchman, Michael J.: *See—*
Zemelman, Valery B.; Kleiner, Fredric; and Kuchman, Michael J., 4,333,315, Cl. 62-1.000.

Kuchuris, George F.: *See—*
Yatsushiro, Kenji; and Kuchuris, George F., 4,334,164, Cl. 310-114.000.

Kuehlthau, Robert L.: *See—*
Imsand, Bruce E.; and Kuehlthau, Robert L., 4,334,124, Cl. 178-19.000.

Kugelfischer Georg Schafer & Co.: *See—*
Schuster, Friedrich; and Hermanns, Hans, 4,333,307, Cl. 57-334.000.

Kuhn, Franz J.: *See—*
Weber, Karl-Heinz; Langbein, Adolf; Lehr, Erich; Boke, Karin; and Kuhn, Franz J., 4,333,944, Cl. 424-269.000.

Kuhne, Karl-Joachim: *See—*
Dembinski, Walter; and Kuhne, Karl-Joachim, 4,333,627, Cl. 248-396.000.

Kuhnert, Gottfried, to Universal-Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG. Left-left flat knitting machine. 4,333,320, Cl. 66-63.000.

Kuivila, Richard P.: *See—*
Daniel, Sam M.; and Kuivila, Richard P., 4,334,283, Cl. 364-744.000.
Kulbe, Bernd: *See—*
Hoppe, Klaus; Muller, Jurgen; Keller, Jurgen; Kulbe, Bernd; Lessig, Klaus; Berlin, Christian; and Danke, Eckhard, 4,333,894, Cl. 261-96.000.
Kulcke, Werner: *See—*
Bohlen, Harald; Engelke, Helmut; Kulcke, Werner; Nehmiz, Peter; and Greschner, Johann, 4,334,156, Cl. 250-491.000.
Kulite Semiconductor Products, Inc.: *See—*
Mallon, Joseph R.; and Kurtz, Anthony D., 4,333,349, Cl. 73-708.000.
Kulprathipanja, Santi; and Bloch, Herman S., to UOP Inc. Technique to reduce the zeolite molecular sieve solubility in an aqueous system. 4,333,768, Cl. 127-46.200.
Kulprathipanja, Santi; and Neuzil, Richard W., to UOP Inc. Technique to reduce the zeolite molecular sieve solubility in an aqueous system. 4,333,769, Cl. 127-46.200.
Kun, Akos. Motion sensing circuit especially for alarm devices. 4,334,218, Cl. 340-689.000.
Kunreuther, Steven. High strength needle assembly with sharpenable cutting edge. 4,333,596, Cl. 227-67.000.
Kuraoka, Yasuo, to Hoxan Corporation. Method of liquefying Freon gas. 4,333,753, Cl. 62-9.000.
Kuraray Co. Ltd.: *See—*
Matsumoto, Mitsuo; and Tamura, Masuhiko, 4,334,042, Cl. 525-339.000.
Yoshimura, Noriaki; and Tamura, Masuhiko, 4,334,117, Cl. 585-509.000.
Kurchacova, Elva; and Safdy, Max E., to Miles Laboratories, Inc. Ethyl 3-(3-indolyl)-3-(5-tetrazolyl) propionate compounds used as anti-hypertensive agents. 4,333,943, Cl. 424-269.000.
Kuris, Arthur. Ultrasonic toothbrush. 4,333,197, Cl. 15-22.00R.
Kurkela, Kauko O. A.: *See—*
Karjalainen, Arto J.; and Kurkela, Kauko O. A., 4,333,947, Cl. 424-273.00R.
Kurobe, Hideharu: *See—*
Yamashita, Fumio; and Kurobe, Hideharu, 4,333,306, Cl. 57-206.000.
Kuroha, Tunemitu: *See—*
Karino, Kimiji; Osawa, Tadao; Nagano, Masami; Sakuma, Tokihiko; Kanazawa, Yuiti; Kuroha, Tunemitu; and Tachibana, Kanji, 4,333,890, Cl. 261-41.00D.
Kuroki, Yoshifumi: *See—*
Takami, Satoshi; Hagiwara, Teruo; Kando, Toru; and Kuroki, Yoshifumi, 4,333,719, Cl. 354-132.000.
Kurtz, Anthony D.: *See—*
Mallon, Joseph R.; and Kurtz, Anthony D., 4,333,349, Cl. 73-708.000.
Kurtz, Garrett W. Container crushing device. 4,333,395, Cl. 100-233.000.
Kurtzman, Ralph H., Jr., to United States of America, Agriculture. Mushroom-growing medium. 4,333,757, Cl. 71-5.000.
Kusche, David W., to Brunswick Corporation. Fuel system for a two-cycle engine. 4,333,425, Cl. 123-73.00R.
Kutnyak, Thomas A., to Automation Industries, Inc. Electrical conduit including helical grounding and reinforcing elements. 4,334,121, Cl. 174-68.00C.
Kuttenbaum, Valentin; and Henle, Ernst, to Josef Uhlmann Maschinenfabrik GmbH & Co. KG. Conveyor device for packaging. 4,333,297, Cl. 53-252.000.
Kuwano, Yukinori: *See—*
Yamano, Masaru; and Kuwano, Yukinori, 4,334,120, Cl. 136-248.000.
Kuyel, Birol, to Western Electric Company, Inc. Methods and apparatus for improving an RF excited reactive gas plasma. 4,333,814, Cl. 204-298.000.
Kuzma, Zygmunt: *See—*
Przyluski, Jan; Madry, Kazimierz; Dolecki, Zbigniew; Kotarski, Andrzej; Drygas, Maria; Kokosinski, Jacek; Kuzma, Zygmunt; and Chelminski, Bohdan, 4,333,802, Cl. 204-54.00R.
Kwart, Harold; and Varadhachary, Seevaram N. Methods for bonding dissimilar synthetic polymeric materials and the products involved in and resulting from such methods. 4,333,987, Cl. 428-419.000.
Kwik Lok Corp.: *See—*
Holmes, Jack H., 4,333,566, Cl. 206-343.000.
Kyoei Zoki Kabushiki Kaisha: *See—*
Hayashi, Takeshi, 4,333,612, Cl. 241-33.000.
L. & C. Steinmuller GmbH: *See—*
Dorling, Rolf; and Hemschemeier, Hans, 4,333,514, Cl. 165-1.000.
Michelfelder, Sigfrid; and Leikert, Klaus, 4,333,405, Cl. 110-264.000.
Labofina S.A.: *See—*
Hanotier, Jacques D. V.; and Hanotier-Bridoux, Monique J. S., 4,334,086, Cl. 562-413.000.
Laboratoires Sarget: *See—*
Creuzet, Marie-Helene; Feniou, Claude; Guichard, Francoise; and Prat, Gisele, 4,333,930, Cl. 424-248.510.
Creuzet, Marie-Helene; Feniou, Claude; Prat, Gisele; and Pontagnier, Henri, 4,333,938, Cl. 424-263.000.
Labovitz, Jeffrey N.: *See—*
Baer, Ted A.; and Labovitz, Jeffrey N., 4,334,087, Cl. 562-459.000.
Lacaze, Pierre C.: *See—*
Dubois, Jacques E.; Pham, Minh-Chau; and Lacaze, Pierre C., 4,334,054, Cl. 528-210.000.
Lacroix, Michel A. B., to Le Materiel Telephonique Thomson-CSF. Electronic device for monitoring the operation of a servo system including a hydraulic jack. 4,334,216, Cl. 340-679.000.
Lafarge: *See—*
Moisset, Jacques; Bonet, Claude; Rouanet, Alain; Petit, Alain; and Delmas, Robert, 4,333,766, Cl. 106-100.000.
Lagakos, Nicholas: *See—*
Tran, Danh C.; Macedo, Pedro B.; Simmons, Joseph H.; Simmons, Catherine J.; and Lagakos, Nicholas, 4,333,847, Cl. 252-629.000.
Lainiere de Picardie: *See—*
Rand, Edward R., 4,333,982, Cl. 428-245.000.
LaMarche, Paul E., to Borg-Warner Corporation. Hydraulic pressure relief valve. 4,333,552, Cl. 192-3.290.
Lamb, Jeffrey: *See—*
Shafrir, Doron; and Lamb, Jeffrey, 4,333,519, Cl. 165-12.000.
Lambert, Lloyd J., Jr.; and Lambert, Lloyd J., Sr. Hack-squat machine. 4,333,644, Cl. 272-118.000.
Lambert, Lloyd J., Sr.: *See—*
Lambert, Lloyd J., Jr.; and Lambert, Lloyd J., Sr., 4,333,644, Cl. 272-118.000.
Landino, Paul J., to Zero-Max Industries, Incorporated. Motor control system. 4,334,182, Cl. 318-808.000.
Landstrom, Sven; and Lundahl, Kaj. Arrangement for launching interference material. 4,333,402, Cl. 102-505.000.
Lane, Wendell: *See—*
Sink, William H.; and Lane, Wendell, 4,333,554, Cl. 192-70.190.
Lang, Raimund; Quittkat, Jorg; Fischer, Gert; and Lather, Dieter, to Mannesmann Aktiengesellschaft; and Nukem GmbH. Stimulating electro-acoustical transducers. 4,333,347, Cl. 73-642.000.
Lang, Richard D.; and Bolton, Theodore S., to Carrier Corporation. Nested hinge members with spring arm catch. 4,333,206, Cl. 16-335.000.
Langbein, Adolf: *See—*
Weber, Karl-Heinz; Langbein, Adolf; Lehr, Erich; Boke, Karin; and Kuhn, Franz J., 4,333,944, Cl. 424-269.000.
Lange, Ronald E.; and Fisher, Richard J., to Honeywell Information Systems Inc. Apparatus for recording the order of usage of locations in memory. 4,334,289, Cl. 364-900.000.
Lankheet, Jay A. Swimming pool construction. 4,333,186, Cl. 4-506.000.
Larsson, Hans M.: *See—*
Karlsson, Tom O. B.; and Larsson, Hans M., 4,333,485, Cl. 134-60.000.
Lasertron Company: *See—*
Genho, Robert K., Sr., 4,333,242, Cl. 33-227.000.
Lather, Dieter: *See—*
Lang, Raimund; Quittkat, Jorg; Fischer, Gert; and Lather, Dieter, 4,333,347, Cl. 73-642.000.
Latos, Edward L., to General Electric Company. Flash lamp array having composite circuit board and electric shield member. 4,334,262, Cl. 362-11.000.
Lau, Philip T. S., to Eastman Kodak Company. Cyan dye-forming couplers. 4,333,999, Cl. 430-17.000.
Laukien, Gunther Rudi: *See—*
Hauz, Gerhard, 4,333,414, Cl. 114-322.000.
Laurita, Robert A. Protective guard for the throat area. 4,333,179, Cl. 2-2.000.
Lawson, John E., to Armco Inc. Method and apparatus for multiple well completion. 4,333,531, Cl. 166-341.000.
Le Materiel Telephonique Thomson-CSF: *See—*
Lacroix, Michel A. B., 4,334,216, Cl. 340-679.000.
Lee, Donald M. Fluidized bed solar energy heater. 4,333,445, Cl. 126-436.000.
Lee, James K., to Eastman Kodak Company. Method of controlling electromagnetic actuator in a camera, and actuator controllable thereby. 4,333,722, Cl. 354-234.000.
Lee, John M.; and Bauman, William C., to Dow Chemical Company, The. Transition metal aluminates. 4,333,846, Cl. 252-184.000.
Lee, Steven J.: *See—*
Katz, Thomas J.; Nair, Mridula; and Lee, Steven J., 4,334,048, Cl. 526-170.000.
Lee, Young-Jin, to Union Carbide Corporation. Process for producing 2,5-dichloro-p-xylene. 4,334,112, Cl. 570-207.000.
Leeds & Northrup Company: *See—*
Connery, James G.; Diascro, Dominick D.; DiNapoli, Louis D.; Punis, Giancarlo; and Matour, Anthony J., 4,333,352, Cl. 73-861.180.
Le Fort, Gilbert J.: *See—*
Bertin, Marcel R.; Boutmy, Patrick E.; Le Fort, Gilbert J.; and Walraet, Jean G., 4,334,303, Cl. 370-13.000.
Lehmacher, Hans. Method of and apparatus for boxing shopping bags. 4,333,298, Cl. 53-447.000.
Lehman, Joseph J.: *See—*
Greiner, James G.; Lehman, Joseph J.; and Priepke, Edward H., 4,333,304, Cl. 56-119.000.
Lehner, August; Hartmann, Heinrich; Heil, Guenter; Lenz, Werner; Buethe, Ingolf; and Bachmann, Rudolf, to BASF Aktiengesellschaft. Process for the preparation of polymerizable polyurethane elastomers. 4,334,034, Cl. 525-28.000.
Lehnert, Gunther: *See—*
Schreckenberg, Manfred; Freitag, Dieter; Burgdorfer, Hans-Heribert; Lehnert, Gunther; Adelmann, Siegfried; and Rudolph, Hans, 4,333,809, Cl. 204-159.140.
Lehr, Erich: *See—*
Weber, Karl-Heinz; Langbein, Adolf; Lehr, Erich; Boke, Karin; and Kuhn, Franz J., 4,333,944, Cl. 424-269.000.

Lehureau, Jean-Claude: *See*—
Arquie, Louis; Bricot, Claude; Lehureau, Jean-Claude; Thirouard, Michel; Le Merer, Jean-Pierre; and Leterme, Dominique, 4,334,300, Cl. 369-46.000.

Leichtfried, Friedrich; and Himmetsberger, Alois, to TMC Corporation. Ski brake. 4,333,667, Cl. 280-605.000.

Leikert, Klaus: *See*—
Michelfelder, Sigfrid; and Leikert, Klaus, 4,333,405, Cl. 110-264.000.

Leliaert, Raymond M.: *See*—
Schulte, Harold F.; Leliaert, Raymond M.; and Rohr, Robert D., 4,333,278, Cl. 51-434.000.

Le Merer, Jean-Pierre: *See*—
Arquie, Louis; Bricot, Claude; Lehureau, Jean-Claude; Thirouard, Michel; Le Merer, Jean-Pierre; and Leterme, Dominique, 4,334,300, Cl. 369-46.000.

Lemke, James U., to Spin Physics, Inc. Apparatus useful for converting asynchronous video information to synchronous video information. 4,334,247, Cl. 360-10.000.

Lemmon, Ernest M.; and Pettigrew, James P. Mounting arrangement for dual wheels. 4,333,688, Cl. 301-36.00R.

Lemonon, Claire: *See*—
Tinet, Claude; and Lemonon, Claire, 4,334,007, Cl. 430-270.000.

Lemrow, Craig M.; and Wilder, Arthur H., to Corning Glass Works. Solar receiver tube support. 4,333,447, Cl. 126-443.000.

Lenz, Werner: *See*—
Lehner, August; Hartmann, Heinrich; Heil, Guenter; Lenz, Werner; Buethe, Ingolf; and Bachmann, Rudolf, 4,334,034, Cl. 525-28.000.

Leonard, Henri, to Micro-Mega S.A. Plate for packaging dental root-canal instruments. 4,333,567, Cl. 206-368.000.

Lerch, Werner, to Fritz Gegauf Aktiengesellschaft Bernina-Nahmaschinenfabrik. Lifting device for the presser foot of a sewing machine. 4,333,407, Cl. 112-237.000.

Lerner, David A., to Singer Company, The. Bobbin thread level detection and display arrangement for a sewing machine. 4,333,411, Cl. 112-278.000.

Lessig, Klaus: *See*—
Hoppe, Klaus; Muller, Jurgen; Keller, Jurgen; Kulbe, Bernd; Lessig, Klaus; Berlin, Christian; and Danke, Eckhard, 4,333,894, Cl. 261-96.000.

Lester, Victor E. Nebulizer-manifold. 4,333,450, Cl. 128-200.140.

Leszyk, Gerald M., to Eastman Kodak Company. Radiation-curable composition for restorative and/or protective treatment of photographic elements. 4,333,998, Cl. 430-12.000.

Leterme, Dominique: *See*—
Arquie, Louis; Bricot, Claude; Lehureau, Jean-Claude; Thirouard, Michel; Le Merer, Jean-Pierre; and Leterme, Dominique, 4,334,300, Cl. 369-46.000.

Lever Brothers Company: *See*—
Duggleby, Peter M.; Foster, Francis G.; and Nooi, Jacobus R., 4,333,844, Cl. 252-97.000.

Levine, Marshall S. Energy auditing kit. 4,334,275, Cl. 364-551.000.

Lewis, Marlan M., to Lewis, Marlan M. System of lattice tiles. 4,333,287, Cl. 52-311.000.

Lewis, Marlan M.: *See*—
Lewis, Marlan M., 4,333,287, Cl. 52-311.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Klank, Otto; and Wahling, Wilfried, 4,334,318, Cl. 455-195.000.

Lichti, Robert D. Fire protective walkway apparatus. 4,333,195, Cl. 14-71.500.

Lieber, Ludwig: *See*—
Roller, Hanno; Ohnmacht, Helmut; Lieber, Ludwig; and Nauerth, Karl-Heinz, 4,334,141, Cl. 219-283.000.

Lifshitz, Nadia; Moran, Joseph M.; and Wang, David N., to Bell Telephone Laboratories, Incorporated. High-selectivity plasma-assisted etching of resist-masked layer. 4,333,793, Cl. 156-643.000.

Lim, John; Brady, Michael; and Stamires, Dennis, to Filtrol Corporation. Attrition resistant zeolite containing catalyst. 4,333,857, Cl. 252-455.00Z.

Liman, Helmut, to Blaupunkt-Werke GmbH. Traffic information radio signal receiver. 4,334,320, Cl. 455-227.000.

Lin, Chia-Cheng: *See*—
Neely, James E., Jr.; Lin, Chia-Cheng; Falleroni, Charlene A.; and Moff, Annette, 4,333,914, Cl. 423-314.000.

Linder, Ernst: *See*—
Muller, Klaus; Maurer, Helmut; Rieger, Franz; and Linder, Ernst, 4,333,439, Cl. 123-569.000.

Lindroth, Thomas A., to Merck & Co., Inc. Water resistant texturized wall coverings. 4,333,863, Cl. 523-220.000.

Lipp, Willi, to Huller Hille GmbH. Method and apparatus for correcting tool lengths and tool radii, particularly for numerically controlled machines equipped with position or path measuring systems by means of nominal-actual value comparison. 4,334,178, Cl. 318-572.000.

Litovitz, T. A.: *See*—
Tran, Danh C.; Macedo, Pedro B.; Simmons, Joseph H.; Simmons, Catherine J.; and Lagakos, Nicholas, 4,333,847, Cl. 252-629.000.

Loc'h, Christian: *See*—
Comar, Dominique; Loc'h, Christian; and Maziere, Bernard, 4,333,911, Cl. 423-2.000.

Lockley, Donald J.: *See*—
Magill, Robert J.; Lockley, Donald J.; and Perrin, Richard J., 4,333,489, Cl. 137-77.000.

Lofting, Hugh J.: *See*—
Mentzer, James R.; and Lofting, Hugh J., 4,333,189, Cl. 6-5.000.

Logan, Joseph S.: *See*—
Beyer, Klaus D.; and Logan, Joseph S., 4,333,794, Cl. 156-648.000.

Lohner, Ingolf; Barnert, Konrad; and Stein, Gunter, to Volkswagenwerk Aktiengesellschaft. Timing control apparatus for fuel injection pump. 4,333,437, Cl. 123-502.000.

Long, Alvin L. Combination motor home and house boat. 4,333,191, Cl. 114-344.000.

Longley, Karl E.; Ratigan, Brian; and Davis, James W., to Fischer & Porter Co. In-line disinfectant contactor. 4,333,833, Cl. 210-198.100.

Longnecker, Russell D. Two-stage can crusher. 4,333,396, Cl. 100-233.000.

Longoni, Angelo: *See*—
Bettarini, Franco; Massardo, Pietro; Piccardi, Paolo; and Longoni, Angelo, 4,334,104, Cl. 568-649.000.

Lorenz, Max R.: *See*—
Bruce, Calvin A.; Homola, Andrew M.; and Lorenz, Max R., 4,333,961, Cl. 427-13.000.

Lorrek, Johannes; and Jokisch, Friedrich, to Krupp-Koppers GmbH. Arrangement for discharging coke from a cooling shaft supplied with cooling gas. 4,333,910, Cl. 422-228.000.

Louzos, Demetrios V., to Union Carbide Corporation. Solid state cell in which an inert nonconductive material is dispersed in the cathode. 4,333,996, Cl. 429-191.000.

Lovas, Joseph R.; Lovas, Paul J.; and Koelmel, Carl F., to Cyloflex, Inc. Portable board mill. 4,333,236, Cl. 30-380.000.

Lovas, Paul J.: *See*—
Lovas, Joseph R.; Lovas, Paul J.; and Koelmel, Carl F., 4,333,236, Cl. 30-380.000.

Lucas Industries Limited: *See*—
Bill, Colin S.; Cockshott, Charles P.; and Francis, John H., 4,334,207, Cl. 336-136.000.
Patey, Daniel F.; and Doyle, Paul M., 4,333,338, Cl. 73-119.00A.
Seilly, Alec H., 4,334,205, Cl. 335-220.000.

Luce, David A., to Norlin Industries, Inc. Voltage controlled attenuator. 4,334,195, Cl. 328-168.000.

Luedicke, Oscar B.; Domzalski, Thad; and Zajac, David, to American Cyanamid Company. Hair cleansing conditioner with lathering action. 4,333,921, Cl. 424-70.000.

Lund, Van M. DC Motor control circuit. 4,334,177, Cl. 318-345.00G.

Lundahl, Kaj: *See*—
Landstrom, Sven; and Lundahl, Kaj, 4,333,402, Cl. 102-505.000.

Luthi, Rudolf: *See*—
Bloeck, Siegfried; Hofling, Erich; Luthi, Rudolf; and Diemi, Werner, 4,333,582, Cl. 220-66.000.

Lutich, Louis L.: *See*—
Harris, Jesse W.; and Lutich, Louis L., 4,333,537, Cl. 173-17.000.

Lynch, William M., to AFL Industries, Inc. Vertical tube liquid pollutant separators. 4,333,835, Cl. 210-305.000.

Lyons, William C.; and White, Albert O. Method for extended straight line drilling from a curved borehole. 4,333,539, Cl. 175-61.000.

Macedo, P. B.: *See*—
Tran, Danh C.; Macedo, Pedro B.; Simmons, Joseph H.; Simmons, Catherine J.; and Lagakos, Nicholas, 4,333,847, Cl. 252-629.000.

Macedo, Pedro B.: *See*—
Tran, Danh C.; Macedo, Pedro B.; Simmons, Joseph H.; Simmons, Catherine J.; and Lagakos, Nicholas, 4,333,847, Cl. 252-629.000.

Macriss, Robert A.: *See*—
Elkins, Robert H.; Durkin, Gary M.; and Macriss, Robert A., 4,333,524, Cl. 165-104.160.

Madry, Kazimierz: *See*—
Przyluski, Jan; Madry, Kazimierz; Dolecki, Zbigniew; Kotarski, Andrzej; Drygas, Maria; Kokosinski, Jacek; Kuzma, Zygmunt; and Chelminski, Bohdan, 4,333,802, Cl. 204-54.00R.

Maekawa, Koji: *See*—
Miyakoshi, Kazumitsu; and Maekawa, Koji, 4,334,279, Cl. 364-710.000.

Magill, Robert J.; Lockley, Donald J.; and Perrin, Richard J., to Actionair Equipment Limited. Spring-motor dual-functioning mechanism. 4,333,489, Cl. 137-77.000.

Magnavox Government and Industrial Electronics Company: *See*—
Chan, James K.; May, Curtis L.; and Spooner, Allan, 4,334,244, Cl. 358-166.000.

Mahan, Douglas P.; Skinner, Richard E.; and McClanathan, Robert A., to Mahan, Douglas P. Microwave treating mechanism. 4,334,136, Cl. 219-10.55B.

Mahoney, Fred G. Hot fuel gas generator with dual controls. 4,333,422, Cl. 123-3.000.

Mahrus, Duraid, to Metal Leve S.A. Industria e Comercio. Method of producing aluminum alloy composite. 4,333,775, Cl. 148-11.50Q.

Mail-Ex Corporation: *See*—
Russell, Robert J., 4,333,300, Cl. 53-569.000.

Maiocco, Nicholas P. Verbal travel instruction systems and method. 4,334,248, Cl. 360-12.000.

Maki, Hiroya; Furusawa, Taketoshi; and Takaishi, Takeo, to Mitsubishi-Jukogyo Kabushiki Kaisha. Kit for determining silica-alumina catalyst in fuel oil. 4,333,908, Cl. 422-61.000.

Makino, Takenori: *See*—
Kawakita, Kenji; Makino, Takenori; and Harada, Norio, 4,334,285, Cl. 364-761.000.

Malakhoff, Alexander: *See*—
Davis, Sydney; and Malakhoff, Alexander, 4,333,413, Cl. 114-67.00A.

Malchow, Max E., to RCA Corporation. Biasing of transistor amplifier cascades. 4,334,198, Cl. 330-296.000.

Maley, Gerald A., to International Business Machines Corporation. Noise suppressing bilevel data signal driver circuit arrangement. 4,334,310, Cl. 371-64.000.

Mallon, Joseph R.; and Kurtz, Anthony D., to Kulite Semiconductor Products, Inc. Binary balancing apparatus for semiconductor transducer structures. 4,333,349, Cl. 73-708.000.

Malzacher, Fred H. Gripper assembly for moving drilling rigs. 4,333,634, Cl. 254-106.000.

Management Assistance Inc.: *See—*
Edwards, James M., 4,334,259, Cl. 361-212.000.

Manche, Emanuel P. Determination of the acceleration of gravity. 4,333,341, Cl. 73-382.00R.

Mangold, Hans, to Grundig E.M.V. Remote control television with external data bus connection. 4,334,242, Cl. 358-127.000.

Mann, Adriaan B., to Goudsche Machinefabriek B.V. Calibrating unit for calibrating a hydraulic or electric pressure gauge, especially of a probing device. 4,333,331, Cl. 73-4.00R.

Mannesmann Aktiengesellschaft: *See—*
Lang, Raimund; Quittkat, Jorg; Fischer, Gert; and Lather, Dieter, 4,333,347, Cl. 73-642.000.

Manning, John F., to Chevron Research. Solid phosphoric acid catalyzed olefin polymerization process. 4,334,118, Cl. 585-529.000.

Mantovani, Elvio; Palladino, Nicola; and Zanobi, Antonio, to Snamprogetti S.p.A. Method for preparing metal-carbonyl clusters immobilized in zeolite and their use as heterogeneous catalysts. 4,334,101, Cl. 568-454.000.

Manville Service Corporation: *See—*
Corbin, Raymond L. R.; and Reinhart, Robert F., 4,333,279, Cl. 52-105.000.

Marathon Manufacturing Company: *See—*
Fox, Mark A., 4,333,510, Cl. 160-177.000.

Marchi, Marcello: *See—*
Campolmi, Stefano; Carletti, Vittorio; and Marchi, Marcello, 4,333,882, Cl. 260-453.300.

Marciandi, Franco; and Relvini, Pasquale, to Montedison S.p.A. Self-extinguishing polymeric compositions. 4,333,869, Cl. 524-100.000.

Marconi Company Limited, The: *See—*
Elliott, George; and Ely, Brian W., 4,333,876, Cl. 260-245.730.
Gordon, John F., 4,334,224, Cl. 343-6.50R.

Marder, William Z., to RCA Corporation. Apparatus for handling deformable components supported in a matrix. 4,333,592, Cl. 226-52.000.

Margulies, Herman, to Sterling Drug Inc. Self-aspirating syringe with frictionally engaged locking collet. 4,333,457, Cl. 128-218.00R.

Margulies, Herman; and Webb, William G., to Sterling Drug Inc. Self-aspirating syringe with positively engaged locking collet. 4,333,458, Cl. 128-218.00R.

Marinelli, Lamberto, to TAK PLAST Company. Footwear article and process. 4,333,247, Cl. 36-11.500.

Marks, Barry M., to A.P.C. Industries, Inc. Electronic marker device and method of making same. 4,334,227, Cl. 343-719.000.

Marley Company, The: *See—*
Holmberg, Joyce D.; and Kinney, Ohler L., Jr., 4,333,749, Cl. 55-257.0PV.

Marmon, Robert A. Shoppers coupon calculator. 4,334,278, Cl. 364-709.000.

Marsh, Phillip W.: *See—*
Wiedenman, Gregory B.; and Marsh, Phillip W., 4,334,287, Cl. 364-900.000.

Martel Catala & Cie: *See—*
Karm, Robert, 4,333,502, Cl. 139-425.00A.

Martelli, Nerio, to NESPAK S.p.A. Societa' Generale per l'Imballaggio. Packaging unit for fruit or like articles. 4,333,571, Cl. 206-499.000.

Marten, John A., to Sun Electric Corporation. Method for determining the gasoline mileage for a vehicle. 4,333,337, Cl. 73-114.000.

Marugg, Max H. Apparatus for homogenizing liquid and viscous substances. 4,333,729, Cl. 417-313.000.

Maruhashi, Kenji: *See—*
Kojima, Ichiro; Maruhashi, Kenji; and Fujiwara, Yasuo, 4,334,021, Cl. 435-118.000.

Maruko Seiyaku Co., Ltd.: *See—*
Ohno, Sachio; Nagasaka, Mitsuaki; and Kato, Kazuo, 4,334,067, Cl. 544-151.000.

Maruya, Takashi: *See—*
Naito, Hiroyuki; Maruya, Takashi; Gotoh, Kyugo; and Ohmori, Hideyo, 4,334,029, Cl. 501-109.000.

Marvin Glass & Associates: *See—*
Jaworski, Eugene; Disko, Harry; and Breslow, Jeffrey D., 4,333,657, Cl. 273-376.000.

Maselli, Maria; Frullini, Alberto; Elbetti, Meri; and Frullini, Luisa. Machine for manufacturing pantyhose with gusset. 4,333,408, Cl. 112-121.150.

Massachusetts Institute of Technology: *See—*
Plotkin, George M.; and Wolf, George, 4,334,017, Cl. 435-7.000.
Smith, Henry I., 4,333,792, Cl. 156-612.000.

Massardo, Pietro: *See—*
Bettarini, Franco; Massardo, Pietro; Piccardi, Paolo; and Longoni, Angelo, 4,334,104, Cl. 568-649.000.

Masuyama, Kenichi: *See—*
Yamada, Yasuyuki; Masuyama, Kenichi; and Kitamoto, Tatsuji, 4,333,988, Cl. 428-425.900.

Mathis, John S.: *See—*
Schrader, Jimmy, 4,333,738, Cl. 44-15.00B.

Matier, William L.: *See—*
Johnson, Porter C.; and Matier, William L., 4,334,088, Cl. 562-462.000.

Matour, Anthony J.: *See—*
Connery, James G.; Diascro, Dominick D.; DiNapoli, Louis D.; Punis, Giancarlo; and Matour, Anthony J., 4,333,352, Cl. 73-861.180.

Matsuda, Eiji, to Tani Saw Mfg. Co., Ltd. Saw blades having coolant passages and apparatus for using the blades. 4,333,371, Cl. 83-169.000.

Matsukawa, Hiroharu: *See—*
Igarashi, Akira; and Matsukawa, Hiroharu, 4,333,984, Cl. 428-336.000.

Matsumoto, Mitsuo; and Tamura, Masuhiko, to Kuraray Co. Ltd. Carbonylation of olefinic compounds. 4,334,042, Cl. 525-339.000.

Matsumura, Shingo; Enomoto, Hiroshi; Aoyagi, Yoshiaki; and Shibata, Yoshihisa, to Nippon Shinyaku Co., Ltd. Benzoguanamine derivatives, their production and pharmaceutical compositions containing the same. 4,333,933, Cl. 424-249.000.

Matsuno, Kenji; and Funamoto, Hiroyuki, to Toyo Seikan Kaisha, Limited. Method of electric welding tinfree cans. 4,334,138, Cl. 219-64.000.

Matsuoka, Yutaka: *See—*
Hashimoto, Katsuhiko; Nambu, Hirohiko; Watari, Kazuhiro; Mizuno, Kenichi; Murakami, Tadateru; Matsuoka, Yutaka; Moriyama, Mitsutoshi; and Ohno, Norio, 4,334,108, Cl. 568-803.000.

Matsushima, Seiichi: *See—*
Ishida, Osamu; Uetani, Yoshio; and Matsushima, Seiichi, 4,333,995, Cl. 429-172.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Aoki, Masaki; and Ohtani, Mitsuhiro, 4,333,861, Cl. 252-518.000.
Kane, Johji, 4,334,230, Cl. 343-797.000.

Matthews, Billie J., to Kimberly-Clark Corporation. Sanitary napkin with improved panty adhesive. 4,333,466, Cl. 128-290.00R.

Mattson, Richard W., to Eltra Corporation. Electronic ignition system with mechanical advance. 4,333,433, Cl. 123-420.000.

Maurer, Helmut: *See—*
Muller, Klaus; Maurer, Helmut; Rieger, Franz; and Linder, Ernst, 4,333,439, Cl. 123-569.000.

Max Roth KG: *See—*
Seeger, Walter, 4,333,544, Cl. 181-266.000.

May, Curtis L.: *See—*
Chan, James K.; May, Curtis L.; and Spooner, Allan, 4,334,244, Cl. 358-166.000.

May, Walder C. Glue gun holder. 4,333,623, Cl. 248-176.000.

Maynard, Michael D. San Francisco cable car puzzle. 4,333,653, Cl. 273-160.000.

Maziere, Bernard: *See—*
Comar, Dominique; Loc'h, Christian; and Maziere, Bernard, 4,333,911, Cl. 423-2.000.

McAlister, Roy E. Apparatus for manifolding multiple passage solar panel. 4,333,789, Cl. 156-499.000.

McBrayer, Robert D.: *See—*
Frost, Rodney I.; McBrayer, Robert D.; and Pujari, Vimal K., 4,333,518, Cl. 165-8.000.

McCarthy, Hubert. Machine and method for producing weather-proofed multi leaf shipping forms. 4,333,784, Cl. 156-252.000.

McCarty, Frederick B., to Garrett Corporation, The. Rotating electrical machine. 4,334,160, Cl. 310-57.000.

McCaslin, Robert E. Electronic toy. 4,333,258, Cl. 46-14.000.

McClaflin, Gifford G., to Conoco Inc. Method of transporting viscous hydrocarbons. 4,333,488, Cl. 137-13.000.

McClanathan, Robert A.: *See—*
Mahan, Douglas P.; Skinner, Richard E.; and McClanathan, Robert A., 4,334,136, Cl. 219-10.55B.

McCombie, Jay C.: *See—*
Brunais, Ellsworth G.; and McCombie, Jay C., 4,333,434, Cl. 123-478.000.

McConnell, Michael V.; and Graham, Paul D., to Federal Signal Corporation. Speaker grille for streamlined light bar mounted on vehicle roof. 4,334,211, Cl. 340-88.000.

McCorquodale, Robert P., to WetCom Engineering Ltd. Oil recovery process. 4,333,529, Cl. 166-267.000.

McCort, Ralph E., to Owens-Corning Fiberglas Corporation. Apparatus and method for dividing fibrous mineral blankets. 4,333,369, Cl. 83-24.000.

McDaniel, Max P.: *See—*
Hawley, Gil R.; and McDaniel, Max P., 4,333,860, Cl. 252-458.000.

McDonald, Brian G., to Beecham Group Limited. Growth promotors for ruminants. 4,333,952, Cl. 424-330.000.

McDonald, Wylie W., to Texas Instruments Incorporated. System and method for providing an audible sound and a tactile feedback in an electronic data processing system. 4,334,280, Cl. 364-710.000.

McFee, Richard. Internal combustion engine. 4,333,424, Cl. 123-39.000.

McGarry, James: *See—*
Barry, James A.; and McGarry, James, 4,333,960, Cl. 426-625.000.

McGraw-Edison Company: *See—*
Block, Thomas S., 4,333,202, Cl. 15-320.000.

McGregor, Adrienne R.: *See—*
Carney, James A.; and McGregor, Adrienne R., 4,333,918, Cl. 424-1.000.

McGuirk, Andrew C.: *See—*
Boulanger, Henry J.; and McGuirk, Andrew C., 4,334,210, Cl. 337-343.000.

McKenna, Quentin M. Spar juncture structure for wind propelled craft. 4,333,412, Cl. 114-39.000.

McLaughlin, Harry P. Latitude finder. 4,333,243, Cl. 33-268.000.
McMahan, John D.: *See—*
Musgrave, Dwight S.; McMahan, John D.; and Downing, Robert L., 4,333,291, Cl. 52-404.000.
McMinn, Curtis J.: *See—*
Kaplan, Howard I.; Bryce, Jerry H.; Johnston, Thomas J.; McMinn, Curtis J.; Willett, John T.; and Richards, Nolan E., 4,333,813, Cl. 204-243.00R.
McMurtry, David R. Coordinate measuring machine. 4,333,238, Cl. 33-174.00L.
McNeely, Gerald W.; and Tummers, Gerardus L. J., to Akzona Incorporated. Steam trap monitor. 4,333,339, Cl. 116-217.000.
McNelia, John F.; and Peterson, Carl R., to United States of America, Navy. Two stage parachute fuze recovery system. 4,333,400, Cl. 102-348.000.
McRitchie, Aalan C.: *See—*
Smith, Rory J. M.; and McRitchie, Aalan C., 4,333,862, Cl. 252-547.000.
Mead Corporation, The: *See—*
Head, Donald L., 4,334,232, Cl. 346-75.000.
Pack, Gary D.; and Weaver, Frederick D., 4,333,849, Cl. 252-316.000.
Mead, John F., to Plessey Mandel und Investments A.G. Jig for coupling of optic-waveguide elements. 4,333,705, Cl. 350-96.200.
Mead Johnson & Company: *See—*
Johnson, Porter C.; and Matier, William L., 4,334,088, Cl. 562-462.000.
Meadors, Howard C., Jr.: *See—*
Gitlin, Richard D.; and Meadors, Howard C., Jr., 4,334,313, Cl. 375-106.000.
Meadows, David F., to DoNel Corporation. Extrusion and building structures. 4,333,284, Cl. 52-222.000.
Meal, John R.; and Sandmore, Donald K., to Western Electric Company, Inc. Apparatus for bonding leads to capacitor blanks. 4,333,213, Cl. 29-25.420.
Medem, Harald: *See—*
Freitag, Dieter; Reinking, Klaus; Idel, Karsten; Medem, Harald; and Bottenbruch, Ludwig, 4,334,053, Cl. 528-179.000.
Medical Concepts, Inc.: *See—*
Moreno, John R.; Byrne, Richard J.; and Shakespeare, Charles B., 4,333,475, Cl. 128-711.000.
Medlin, Richard C. Multi-layered bulletproof window. 4,333,282, Cl. 52-172.000.
Medtronic, Inc.: *See—*
Athearn, Lee F., 4,333,997, Cl. 429-218.000.
Barthel, Thomas C., 4,333,470, Cl. 128-419.0PG.
Meinel, Erhard; and Meinel, Kathe. Stringing for musical instruments. 4,333,379, Cl. 84-297.00S.
Meinel, Kathe: *See—*
Meinel, Erhard; and Meinel, Kathe, 4,333,379, Cl. 84-297.00S.
Meininger, Fritz: *See—*
Steuernagel, Hans H.; Hoyer, Ernst; and Meininger, Fritz, 4,334,076, Cl. 548-375.000.
Melin, Lars E., to Antiphon AB. Method of eliminating creep in screw joints or riveted joints. 4,333,222, Cl. 29-445.000.
Melocik, Grant C.: *See—*
Baumgartner, Kenneth A.; Melocik, Grant C.; and Stoller, Keith A., 4,334,176, Cl. 318-102.000.
Memorex Corporation: *See—*
Ellenberger, Michael L., 4,333,229, Cl. 29-603.000.
Menge, Heinz-Gunter: *See—*
Eistetter, Klaus; Kley, Hans-Peter; Menge, Heinz-Gunter; and Schaefer, Hartmann, 4,333,942, Cl. 424-267.000.
Mennick, Paul E. Flexible horseshoe. 4,333,532, Cl. 168-24.000.
Mentzer, James R.; and Lofting, Hugh J. Automatic bee feeder. 4,333,189, Cl. 6-5.000.
Merbach, Paul C., to Westinghouse Electric Corp. Numerical control system with following error monitor. 4,334,266, Cl. 364-167.000.
Merck & Co., Inc.: *See—*
Belanger, Patrice C.; Rokach, Joshua; Young, Robert N.; and Scheigetz, John, 4,334,077, Cl. 549-12.000.
Buhs, Rudolf P.; Jacob, Theodore A.; Miwa, Gerald; Sestokas, Elena; Taub, Rae; and Walsh, John S., 4,333,925, Cl. 424-181.000.
Lindroth, Thomas A., 4,333,863, Cl. 523-220.000.
Meridian Industries Inc.: *See—*
Witte, Earl R., 4,333,267, Cl. 47-84.000.
Merrell, David A., to Hughes Aircraft Company. Expanding helical seal for pistons and the like. 4,333,661, Cl. 277-203.000.
Merritt, David T.: *See—*
Higgins, Robert S.; and Merritt, David T., 4,333,527, Cl. 166-117.500.
Metal Leve S.A. Industria e Comercio: *See—*
Mahrus, Duraid, 4,333,775, Cl. 148-11.50Q.
Metallgesellschaft Aktiengesellschaft: *See—*
Dorr, Karl H.; Diekmann, Helmut; Grimm, Hugo; Sander, Ulrich; Tacke, Michael; and Weber, Waldemar, 4,333,917, Cl. 423-522.000.
Metzinger, Lothar; Zipp, Otmar; and Bollmann, Heinz, to BASF Aktiengesellschaft. Process for the manufacture of polyurethane elastomers. 4,334,033, Cl. 521-159.000.
Meulenberg, Daniel R. Method and apparatus for manufacturing decals. 4,333,781, Cl. 156-152.000.
Meyer, Klaus-Rudolf; Hornung, Karl-Heinz; Feldmann, Rainer; and Smigerski, Hans-Jurgen, to Chemische Werke Huls AG. Method for polytropically precipitating polyamide powder coating compositions where the polyamides have at least 10 aliphatically bound carbon atoms per carbonamide group. 4,334,056, Cl. 528-496.000.
Mez, Hans-Christian: *See—*
Bartels, Hermann; Mez, Hans-Christian; Huber, Walter; and Stolz, Hans-Peter, 4,333,356, Cl. 73-864.210.
Michael, Harald. Pneumatically driven drainage facility. 4,333,487, Cl. 137-2.000.
Michael, Harald, to Electrolux GmbH. Vacuum drain system. 4,333,830, Cl. 210-170.000.
Michael, Peter C., to Micro Consultants Limited. T.V. Special effects generator. 4,334,245, Cl. 358-183.000.
Michelfelder, Sigfrid; and Leikert, Klaus, to L. & C. Steinmuller GmbH. Burner for combustion of powdered fuels. 4,333,405, Cl. 110-264.000.
Michlin Chemical Corporation: *See—*
Thies, Edward J.; and Michlin, Norman, 4,333,752, Cl. 55-387.000.
Michlin, Norman: *See—*
Thies, Edward J.; and Michlin, Norman, 4,333,752, Cl. 55-387.000.
Micro Consultants Limited: *See—*
Michael, Peter C., 4,334,245, Cl. 358-183.000.
Micro-Mega S.A.: *See—*
Leonard, Henri, 4,333,567, Cl. 206-368.000.
Midrex Corporation: *See—*
Ahrendt, William A.; and Beggs, Donald, 4,333,761, Cl. 75-35.000.
Mifune, Hiroyuki; Ishiguro, Shoji; Shishido, Tadao; Fuseya, Yoshiharu; and Tsujikawa, Teruaki, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive element. 4,334,010, Cl. 430-551.000.
Mifune, Hiroyuki; Shishido, Tadao; Ishiguro, Shoji; and Ueyanagi, Jisaburo, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive elements. 4,334,014, Cl. 430-611.000.
Miglin, Bruce P.: *See—*
Krueger, Robert H.; Albertson, Clarence E.; and Miglin, Bruce P., 4,333,516, Cl. 165-1.000.
Mignot, Andre G. E., to Eastman Kodak Company. Silver halide precipitation process with deletion of materials. 4,334,012, Cl. 430-567.000.
Miko, Sandor, to RCA Corporation. Free-running push-pull inverter. 4,334,267, Cl. 363-133.000.
Milberger, Ernest C.; Bremer, Noel J.; and Dria, Dennis E., to Standard Oil Company, The. Mixed vanadium phosphorus oxide catalysts and preparation thereof. 4,333,853, Cl. 252-435.000.
Miles Laboratories, Inc.: *See—*
Baniel, Avraham M., 4,334,095, Cl. 562-584.000.
Buckler, Robert T.; and Schroeder, Hartmut R., 4,334,069, Cl. 544-237.000.
Hartzler, Harold E., 4,333,523, Cl. 165-73.000.
Kotick, Michael P.; and Polazzi, Joseph O., 4,334,071, Cl. 546-74.000.
Kurchacova, Elva; and Safdy, Max E., 4,333,943, Cl. 424-269.000.
Miller, Jacky F. A., to Compagnie Internationale pour l'Informatique CII Honeywell Bull (Societe Anonyme). Automatic document processing machine. 4,333,640, Cl. 271-9.000.
Miller, John W.: *See—*
Rinker, William R.; Ayers, Harry R.; and Miller, John W., 4,333,779, Cl. 156-73.100.
Miller, Michael E.; and Hummel, Richard J., to Sam Stein Associates, Inc. Apparatus for distributing and sifting Japanese style bread crumbs in a typical breading machine for coating edible food products. 4,333,415, Cl. 118-16.000.
Miller, Robert J., to Colt Industries Operating Corp. Tamper proof sealing plug. 4,333,891, Cl. 261-41.00D.
Miller, Roscoe E. Enema apparata improvements relating double contrast studies. 4,333,460, Cl. 128-239.000.
Mills, Alfred L.; Weatherley, Laurence R.; and Crofts, John A., to United Kingdom Atomic Energy Authority. Method for dissolving plutonium-containing nuclear fuels. 4,333,912, Cl. 423-20.000.
Minagawa, Shoichi; and Okamoto, Takeshi, to Clarion Co., Ltd. Elastic surface wave device. 4,334,167, Cl. 310-313.00R.
Mindt, Wolfgang: *See—*
Eberhard, Patrick; and Mindt, Wolfgang, 4,333,473, Cl. 128-635.000.
Mings, Joe D., to Texas Instruments Incorporated. Automotive surge suppressor. 4,334,256, Cl. 361-56.000.
Minnesota Mining and Manufacturing Company: *See—*
Raddatz, John A., 4,333,624, Cl. 248-205.00R.
Yarian, Dean R., 4,334,015, Cl. 435-1.000.
Mischo, Klaus: *See—*
Paulus, Rudolf; and Mischo, Klaus, 4,334,219, Cl. 340-712.000.
Mita Industrial Company: *See—*
Miyakawa, Nobuhiro; and Aizawa, Tatsuo, 4,333,967, Cl. 427-148.000.
Mitsu Petrochemical Industries Ltd.: *See—*
Hashimoto, Katsuhiko; Nambu, Hirohiko; Watari, Kazuhiro; Mizuno, Kenichi; Murakami, Tadateru; Matsuoka, Yutaka; Moriyama, Mitsutoshi; and Ohno, Norio, 4,334,108, Cl. 568-803.000.
Mitsubisha Corporation: *See—*
Naito, Hiroyuki; Maruya, Takashi; Gotoh, Kyugo; and Ohmori, Hideyo, 4,334,029, Cl. 501-109.000.
Mitsubishi Chemical Industries, Ltd.: *See—*
Ofuchi, Kunihiko; Oda, Koichiro; and Nakao, Kenichiro, 4,333,927, Cl. 424-238.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Abe, Haruhiko; Nagatomo, Masao; Tsubouchi, Natsuro; Harada, Hiroshi; and Mitsuhashi, Junichi, 4,333,226, Cl. 29-576.00B.

Komurasaki, Satoshi; Watanabe, Isao; and Ito, Osamu, 4,334,299, Cl. 369-44.000.
Oomura, Etsuji; Murotani, Toshio; and Ishii, Makoto, 4,334,311, Cl. 372-47.000.
Toriu, Jirou, 4,334,252, Cl. 360-104.000.

Mitsubishi Gas Chemical Co., Ltd.: *See*—
Abe, Koichi; Ishihara, Masami; and Watanabe, Thuyoshi, 4,334,080, Cl. 560-99.000.

Mitsubishi-Jukogyo Kabushiki Kaisha: *See*—
Maki, Hiroya; Furusawa, Taketoshi; and Takaishi, Takeo, 4,333,908, Cl. 422-61.000.

Mitsubishi Petrochemical Company Limited: *See*—
Fujii, Masaki; and Miyabayashi, Mitsutaka, 4,334,040, Cl. 525-321.000.
Fujita, Taketoshi; Ohgi, Yasuyuki; and Nemoto, Yousui, 4,334,035, Cl. 525-34.000.
Hayashi, Tatsuo; Itoh, Ryouichi; and Tsuji, Tatsumi, 4,333,897, Cl. 264-40.600.

Mitsuhashi, Junichi: *See*—
Abe, Haruhiko; Nagatomo, Masao; Tsubouchi, Natsuro; Harada, Hiroshi; and Mitsuhashi, Junichi, 4,333,226, Cl. 29-576.00B.

Mitsui Toatsu Chemicals, Inc.: *See*—
Konoki, Keizo; Nobue, Michio; Fukui, Akito; and Inoue, Shigeru, 4,334,096, Cl. 564-72.000.

Mitsui, Tomiyoshi, to Honda Giken Kogyo Kabushiki Kaisha. Carburetor. 4,333,886, Cl. 261-18.00R.

Miwa, Gerald: *See*—
Buhs, Rudolf P.; Jacob, Theodore A.; Miwa, Gerald; Sestokas, Elena; Taub, Rae; and Walsh, John S., 4,333,925, Cl. 424-181.000.

Miwa Lock Co., Ltd.: *See*—
Wake, Kiyoyasu, 4,333,327, Cl. 70-276.000.

Miyabayashi, Mitsutaka: *See*—
Fujii, Masaki; and Miyabayashi, Mitsutaka, 4,334,040, Cl. 525-321.000.

Miyabayashi, Toshio: *See*—
Kotani, Teizo; Takemura, Yasuhiko; and Miyabayashi, Toshio, 4,334,044, Cl. 525-379.000.

Miyahara, Nobufumi; and Uchida, Takashi, to Kanto Kasei Kogyo Kabushiki Kaisha. Rotary magnetic sensor. 4,334,166, Cl. 310-268.000.

Miyakawa, Keizo: *See*—
Koizumi, Hajime; Toyama, Kozo; Kobayashi, Mikio; Hatano, Hajime; Saeki, Toshio; Mizukoshi, Kaoru; Tamanaga, Shinichi; Miyakawa, Keizo; and Kato, Tomoyasu, 4,333,285, Cl. 52-252.000.

Miyakawa, Nobuhiro; and Aizawa, Tatsuo, to Mita Industrial Company. Process of making a thermosensitive recording material. 4,333,967, Cl. 427-148.000.

Miyakoshi, Kazumitsu; and Maekawa, Koji, to Sharp Kabushiki Kaisha. Display device for electronic calculators or the like. 4,334,279, Cl. 364-710.000.

Miyamura, Sadao, to SS Pharmaceutical Co., Ltd. Novel substance M-9337 and process for preparing same. 4,334,025, Cl. 435-253.000.

Miyatake, Takafumi: *See*—
Kashioka, Seiji; Shima, Yoshihiro; and Miyatake, Takafumi, 4,334,241, Cl. 358-107.000.

Mizoi, Kazutoshi: *See*—
Ono, Hiroshi; and Mizoi, Kazutoshi, 4,334,315, Cl. 455-11.000.

Mizukoshi, Kaoru: *See*—
Koizumi, Hajime; Toyama, Kozo; Kobayashi, Mikio; Hatano, Hajime; Saeki, Toshio; Mizukoshi, Kaoru; Tamanaga, Shinichi; Miyakawa, Keizo; and Kato, Tomoyasu, 4,333,285, Cl. 52-252.000.

Mizuno, Kenichi: *See*—
Hashimoto, Katsuhiko; Nambu, Hirohiko; Watari, Kazuhiro; Mizuno, Kenichi; Murakami, Tadateru; Matsuoka, Yutaka; Moriyama, Mitsutoshi; and Ohno, Norio, 4,334,108, Cl. 568-803.000.

Mizusawa Kazahu Kogyo Kabushiki Kaisha: *See*—
Naito, Hiroyuki; Maruya, Takashi; Gotoh, Kyugo; and Ohmori, Hideyo, 4,334,029, Cl. 501-109.000.

Mo och Domsjo Aktiebolag: *See*—
Frisk, Olof E., 4,333,560, Cl. 198-519.000.

Mobil Oil Corporation: *See*—
Nahmias, A. Michael, 4,333,968, Cl. 427-173.000.

Mobius, Werner. Pencil sharpener. 4,333,506, Cl. 145-3.100.

Modes, Edward E. Can flattening device. 4,333,397, Cl. 100-233.000.

Moff, Annette: *See*—
Neely, James E., Jr.; Lin, Chia-Cheng; Falleroni, Charlene A.; and Moff, Annette, 4,333,914, Cl. 423-314.000.

Moffatt, William G., to General Electric Company. Copper-steel composite commutator bar. 4,334,165, Cl. 310-233.000.

Moisset, Jacques; Bonet, Claude; Rouanet, Alain; Petit, Alain; and Delmas, Robert, to Lafarge. Calcium process for manufacturing silicate and/or aluminate based products. 4,333,766, Cl. 106-100.000.

Molex Incorporated: *See*—
Funcik, Jack F.; Bennet, Joseph C.; Tubbs, Joseph T.; and Schneider, Thomas E., 4,333,230, Cl. 29-749.000.

Moller, Fred L.: *See*—
Ekdahl, Per A. A.; and Moller, Fred L., 4,334,257, Cl. 361-119.000.

Molten Rubber Industry Co., Ltd.: *See*—
Aoyama, Masayoshi, 4,333,648, Cl. 273-65.0EB.

Monarch Marking Systems, Inc.: *See*—
Hamisch, Paul H., Jr.; and Pabodie, Robert M., 4,333,399, Cl. 101-401.200.

Monsanto Company: *See*—
Dupre, Carl R., 4,334,039, Cl. 525-263.000.
Van Eenam, Donald N., 4,333,971, Cl. 427-389.900.

Monson, Clifford L. Rotary flooring surface treating device. 4,333,204, Cl. 15-321.000.

Montedison S.p.A.: *See*—
Bettarini, Franco; Massardo, Pietro; Piccardi, Paolo; and Longoni, Angelo, 4,334,104, Cl. 568-649.000.
Campolmi, Stefano; Carletti, Vittorio; and Marchi, Marcello, 4,333,882, Cl. 260-453.300.
Govoni, Gabriele; Rubichi, Gianfranco; and Guardigli, Pierluigi, 4,334,057, Cl. 528-500.000.
Marciandi, Franco; and Relvini, Pasquale, 4,333,869, Cl. 524-100.000.

Montemarano, Joseph. Drinking spout cover. 4,333,583, Cl. 220-90.400.

Montgomery, Donald N., to United States of America, Army. Mechanism for selectively adjusting ammunition feed chutes. 4,333,386, Cl. 89-33.0SF.

Montgomery, Francis E.; Short, James E., Jr.; and Weaver, William J., to United States of America, Navy. Reclamation of materials from photoflash cartridges. 4,333,737, Cl. 23-297.000.

Mookherjee, Braja D.; Trenkle, Robert W.; Wilson, Richard A.; Schmitt, Frederick L.; Vock, Manfred H.; Granda, Edward J.; Vinals, Joaquin; Kiwala, Jacob; and Schreiber, William L., to International Flavors & Fragrances Inc. Trans,trans-Δ-damascone, mixtures containing major proportions of same, processes for preparing same and organoleptic uses thereof. 4,334,098, Cl. 568-347.000.

Moon, Howard R.: *See*—
Beiswenger, John L.; Moon, Howard R.; Chaphalkar, Dhananjay V.; and Smiesko, Frank A., 4,333,493, Cl. 137-268.000.

Moore, Douglas R.; and Swain, Richard S., to Norlin Industries, Inc. Apparatus for reinforcing notes selected by more than one key. 4,333,376, Cl. 84-1.270.

Moore, Frederic J., to Zenith Radio Corporation. Self tracking tuner. 4,334,323, Cl. 455-179.000.

Moore, Richard A.: *See*—
Ramlow, Gerhard G.; Heyman, Duane A.; and Moore, Richard A., 4,334,049, Cl. 526-202.000.

Moran, Joseph M.: *See*—
Lifshitz, Nadia; Moran, Joseph M.; and Wang, David N., 4,333,793, Cl. 156-643.000.

Moreno, John R.; Byrne, Richard J.; and Shakespeare, Charles B., to Medical Concepts, Inc. Ambulatory cardiac monitoring system. 4,333,475, Cl. 128-711.000.

Morikawa, Minoru; Kokubu, Sadao; and Hirai, Tadashi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Steering shaft locking device. 4,333,325, Cl. 70-186.000.

Morimoto, Shigeo: *See*—
Tamai, Masaharu; Adachi, Takashi; Morimoto, Shigeo; Oguma, Kiyoshi; Hanada, Kazunori; and Omura, Sadafumi, 4,333,879, Cl. 549-549.000.

Morisawa, Kunio: *See*—
Taga, Yutaka; and Morisawa, Kunio, 4,333,359, Cl. 74-467.000.

Morishita, Masanobu; and Tanaka, Takanori, to Nippon Electric Co., Ltd. Color image pickup apparatus with multi-solid-state image pickup devices. 4,334,238, Cl. 358-43.000.

Moriyama, Mitsutoshi: *See*—
Hashimoto, Katsuhiko; Nambu, Hirohiko; Watari, Kazuhiro; Mizuno, Kenichi; Murakami, Tadateru; Matsuoka, Yutaka; Moriyama, Mitsutoshi; and Ohno, Norio, 4,334,108, Cl. 568-803.000.

Morphet, Kerry A.: *See*—
Faryna, Myron; and Morphet, Kerry A., 4,333,889, Cl. 261-39.00B.

Morris, Robert V.: *See*—
Rogan, John B.; and Morris, Robert V., 4,334,047, Cl. 526-138.000.

Morrison, Clyde A.; and Sattler, Joseph P., to United States of America, Army. System and method for testing the reaction of rare earth ions. 4,333,344, Cl. 73-584.000.

Morriss, James C., Jr., to JCM Industries, Inc. Pipe clamp with improved band connection. 4,334,140, Cl. 219-127.000.

Morton, Virgil R., to Verco Manufacturing, Inc. Shear load resistant structure. 4,333,280, Cl. 52-167.000.

Motegi, Shoji: *See*—
Ooki, Norihiro; Motegi, Shoji; and Watanabe, Masatoshi, 4,334,159, Cl. 310-54.000.

Motorola, Inc.: *See*—
Beesley, Graham E., 4,334,317, Cl. 455-194.000.
Boney, Joel F.; Rupp, Edward J., II; and Thomas, James S., 4,334,268, Cl. 364-200.000.
Daniel, Sam M.; and Kuivila, Richard P., 4,334,283, Cl. 364-744.000.
Turney, William J.; and Piesinger, Gregory H., 4,334,185, Cl. 323-280.000.

Motoyama, Kazuyasu; and Kato, Toshikazu, to Olympus Optical Co., Ltd. Tape recorder. 4,334,253, Cl. 360-137.000.

MTD Products Inc.: *See*—
Plamper, Gerhard R., 4,333,303, Cl. 56-11.300.

Muehlner, Dirk J.: *See*—
Geusic, Joseph E.; Muehlner, Dirk J.; and Nelson, Terence J., 4,334,291, Cl. 365-36.000.

Mueller, Wilfred; Inghram, Donald M.; and Walker, William B., to FMC Corporation. Proportional mix system and method for applying a thixotropic de-icing fluid to an aircraft. 4,333,607, Cl. 239-13.000.

Muller, Ernest G., to Colgate-Palmolive Company. Borated polysaccharide absorbents and absorbent products. 4,333,461, Cl. 128-284.000.

Muller, Friedhelm: *See*—
Nickel, Horst; Muller, Friedhelm; and Mummenhoff, Peter, 4,333,874, Cl. 260-153.000.
Muller, Heinz; Jauchen, Peter; Szonn, Bodo; and Schulze, Rolf, to Beiersdorf Aktiengesellschaft. Water resistant adhesive strip. 4,333,449, Cl. 128-155.000.
Muller, Jurgen: *See*—
Hoppe, Klaus; Muller, Jurgen; Keller, Jurgen; Kulbe, Bernd; Lessig, Klaus; Berlin, Christian; and Danke, Eckhard, 4,333,894, Cl. 261-96.000.
Muller, Klaus; Maurer, Helmut; Rieger, Franz; and Linder, Ernst, to Robert Bosch GmbH. Apparatus for controlling the exhaust gas recirculation rate in an internal combustion engine. 4,333,439, Cl. 123-569.000.
Mulligan, William L.; and House, Thomas R., to Parks-Cramer Company. Traveling pneumatic cleaner and automatic unloading arrangement and method. 4,333,772, Cl. 134-18.000.
Mumford, George V., to Owens-Illinois, Inc. Tamperproof closure. 4,333,577, Cl. 215-246.000.
Mummenhoff, Peter: *See*—
Nickel, Horst; Muller, Friedhelm; and Mummenhoff, Peter, 4,333,874, Cl. 260-153.000.
Munoz, Donald L.; Grote, Daniel A.; Bronder, David G.; and Weis, Gerald J., to Thermoplastics Incorporated. Truck bed liner assembly. 4,333,678, Cl. 296-39.00R.
Murakami, Tadateru: *See*—
Hashimoto, Katsuhiko; Nambu, Hirohiko; Watari, Kazuhiro; Mizuno, Kenichi; Murakami, Tadateru; Matsuoka, Yutaka; Moriyama, Mitsutoshi; and Ohno, Norio, 4,334,108, Cl. 568-803.000.
Murakami, Teruo, to Tokyo Shibaura Denki Kabushiki Kaisha. Optical recording element and its manufacturing method. 4,334,233, Cl. 346-135.100.
Murata, Susumu; Shimizu, Noriyuki; and Kokeguchi, Sadao, to Kanebo Foods, Ltd. Processed dried beans as instant food and their manufacturing method. 4,333,955, Cl. 426-44.000.
Murdock, Keith C., to American Cyanamid Company. 5,8-Dihydroxy-1,4-bis(guanidinylamino)anthraquinones. 4,333,875, Cl. 260-239.0BC.
Murotani, Toshio: *See*—
Oomura, Etsuji; Murotani, Toshio; and Ishii, Makoto, 4,334,311, Cl. 372-47.000.
Murphy, John R.: *See*—
Otten, Jay G.; Heyman, Duane A.; and Murphy, John R., 4,334,031, Cl. 521-106.000.
Musgrave, Dwight S.; McMahan, John D.; and Downing, Robert L., to Owens-Corning Fiberglas Corporation. Insulated roof structure. 4,333,291, Cl. 52-404.000.
Musgrave, Dwight S., to Owens-Corning Fiberglas Corporation. Insulated roof structure. 4,333,292, Cl. 52-404.000.
Muylle, Wilfried E.; and Kreiter, Heinz, to AGFA-GEVAERT N.V. Rotary cross-cutting apparatus for cutting continuously moving webs. 4,333,372, Cl. 83-324.000.
Muzslay, Steven Z.: *See*—
Anhalt, John W.; and Muzslay, Steven Z., 4,333,703, Cl. 339-217.00S.
Myerholtz, Carl A.; and Myerholtz, Ralph W., Jr., to Standard Oil Company (Indiana). Apparatus for computing flow rate of thermoplastic material. 4,333,336, Cl. 73-56.000.
Myerholtz, Ralph W., Jr.: *See*—
Myerholtz, Carl A.; and Myerholtz, Ralph W., Jr., 4,333,336, Cl. 73-56.000.
Myers, John D.; and Vollers, Charles S., to Kigre, Inc. Athermal laser glass composition. 4,333,848, Cl. 252-301.40P.
Nagami, Akira, to Nippon Electric Co., Ltd. Memory device. 4,334,295, Cl. 365-222.000.
Nagano, Masami: *See*—
Karino, Kimiji; Osawa, Tadao; Nagano, Masami; Sakuma, Tokihiko; Kanazawa, Yuiti; Kuroha, Tunemitu; and Tachibana, Kanji, 4,333,890, Cl. 261-41.00D.
Nagasaka, Mitsuaki: *See*—
Ohno, Sachio; Nagasaka, Mitsuaki; and Kato, Kazuo, 4,334,067, Cl. 544-151.000.
Nagatani, Yasuo: *See*—
Tanaka, Hiroichiro; and Nagatani, Yasuo, 4,334,175, Cl. 318-66.000.
Nagatomo, Masao: *See*—
Abe, Haruhiko; Nagatomo, Masao; Tsubouchi, Natsuro; Harada, Hiroshi; and Mitsuhashi, Junichi, 4,333,226, Cl. 29-576.00B.
Nagatsuma, Kazuyuki: *See*—
Ito, Yukio; Nagatsuma, Kazuyuki; Jyomura, Sigeru; Ashida, Sakichi; and Takeuchi, Hiroshi, 4,333,842, Cl. 252-62.900.
Nagel, Peter; Schoettle, Klaus; Wittkamp, Reinrich; and Hauck, Karl, to BASF Aktiengesellschaft. Apparatus for the production of magnetic recording media in tape form. 4,333,418, Cl. 118-106.000.
Nagy, Lajos: *See*—
Toke, Laszlo; Szabo, Gabor T.; Szabo, Gabor; Nagy, Lajos; and Rusznak, Istvan, 4,334,103, Cl. 568-631.000.
Nahmias, A. Michael, to Mobil Oil Corporation. Thermoplastic packaging films with improved heat-seal characteristics. 4,333,968, Cl. 427-173.000.
Nailor, Michael T.; and Hart, Andrew J. Fire damper. 4,333,392, Cl. 98-1.000.
Naiman, Michael I.; and Buriks, Rudolf S., to Petrolite Corporation. Olefin-acrylonitrile copolymers and uses thereof. 4,333,741, Cl. 44-62.000.
Nair, Mridula: *See*—
Katz, Thomas J.; Nair, Mridula; and Lee, Steven J., 4,334,048, Cl. 526-170.000.
Nair, Vijay G.; and Bernstein, Seymour, to American Cyanamid Company. Rutin poly(H—)sulfate salts and related compounds. 4,334,058, Cl. 536-8.000.
Naito, Hiroyuki; Maruya, Takashi; Gotoh, Kyugo; and Ohmori, Hideyo, to Mizusawa Kazahu Kogyo Kabushiki Kaisha; Mitsubisha Corporation; and Yamato Refractives & Co. Unfired refractory composition. 4,334,029, Cl. 501-109.000.
Naito, Kenji: *See*—
Iiyama, Masahiko; Sanka, Tsugio; and Naito, Kenji, 4,333,429, Cl. 123-274.000.
Nakada, Akira: *See*—
Okumura, Takatoshi; Nakada, Akira; Uchiyama, Yasuji; Aoki, Eiichiro; Yamaga, Eiichi; and Oya, Akiyoshi, 4,333,374, Cl. 84-1.010.
Nakagawa, Sachio: *See*—
Kobayashi, Masayoshi; Sakuranaka, Toru; and Nakagawa, Sachio, 4,333,432, Cl. 123-366.000.
Nakai, Tadanobu, to Tokiwa Chemical Industries, Limited. Nipple cover. 4,333,471, Cl. 128-505.000.
Nakajima, Masayuki: *See*—
Agui, Takesi; Nakajima, Masayuki; and Iwata, Koichi, 4,334,274, Cl. 364-515.000.
Nakajima, Yasuo; and Kikuchi, Kazuhiro, to Nissan Motor Company, Ltd. Knocking discrimination apparatus. 4,333,334, Cl. 73-35.000.
Nakamura, Kenzi, to Sanyo Electric Co., Ltd. Ferrite core type transformer. 4,334,206, Cl. 336-96.000.
Nakano, Koichi: *See*—
Shibasaki, Yoshihisa; Sakamura, Ken; Sakamae, Waichi; Nakano, Koichi; and Aiso, Hideo, 4,334,269, Cl. 364-200.000.
Nakano, Tadao, to Zenmi Co., Ltd. Sanitary napkin. 4,333,464, Cl. 128-290.00R.
Nakao, Kenichiro: *See*—
Ofuchi, Kunihiko; Oda, Koichiro; and Nakao, Kenichiro, 4,333,927, Cl. 424-238.000.
Nakazawa, Hidetsugu; Yamane, Ichiro; and Akutsu, Eiichi, to Ajinomoto Company Incorporated. Method of producing L-glutamic acid by fermentation. 4,334,020, Cl. 435-110.000.
Nakazeki, Tsugito; and Harada, Haruhisa, to NTN Toyo Bearing Company, Limited. Fuel injection device. 4,333,435, Cl. 123-489.000.
Nambu, Hirohiko: *See*—
Hashimoto, Katsuhiko; Nambu, Hirohiko; Watari, Kazuhiro; Mizuno, Kenichi; Murakami, Tadateru; Matsuoka, Yutaka; Moriyama, Mitsutoshi; and Ohno, Norio, 4,334,108, Cl. 568-803.000.
Nard, Georges P.; Bourasseau, Daniel J. E.; and Rabian, Jean M., to Societe d'Etudes, Recherches et Construction Electroniques Sercel. Transmission of time referenced radio waves. 4,334,314, Cl. 375-111.000.
Nash, Alan R. B. Adjustable spring-return actuator. 4,333,391, Cl. 92-121.000.
Nass, Arno, to Bison-Werke Bahre und Greten GmbH & Co., KG. Method for the manufacture of an adhesive from animal blood. 4,333,767, Cl. 106-161.000.
National Research Development Corp.: *See*—
Strawson, Kenneth H.; and Spencer, Gerald, 4,333,895, Cl. 264-24.000.
Nauerth, Karl-Heinz: *See*—
Roller, Hanno; Ohnmacht, Helmut; Lieber, Ludwig; and Nauerth, Karl-Heinz, 4,334,141, Cl. 219-283.000.
Neathery, William D.: *See*—
Drees, Jan M.; Dooley, Larry W.; and Neathery, William D., 4,333,728, Cl. 416-134.00A.
Nedelec, Lucien: *See*—
Guillaume, Jacques; Nedelec, Lucien; and Dumont, Claude, 4,333,939, Cl. 424-263.000.
Nedre Norrlands Producentforening ek. for, Bangardsgatan: *See*—
Egnell, Eric R., 4,333,958, Cl. 426-583.000.
Neef, Gunter; Eder, Ulrich; Haffer, Gregor; Sauer, Gerhard; Wiechert, Rudolf; and Steinbeck, Hermann, to Schering, Aktiengesellschaft. 16 α-Alkyl steroids, their preparation, and pharmaceutical preparations thereof. 4,333,928, Cl. 424-243.000.
Neeff, Rutger, to Bayer Aktiengesellschaft. Process for the preparation of triazinylamino-anthraquinones. 4,334,068, Cl. 544-187.000.
Neely, James E., Jr.; Lin, Chia-Cheng; Falleroni, Charlene A.; and Moff, Annette, to PPG Industries, Inc. Method for making aluminum trimetaphosphates from powder reactants. 4,333,914, Cl. 423-314.000.
Nehmiz, Peter: *See*—
Bohlen, Harald; Engelke, Helmut; Kulcke, Werner; Nehmiz, Peter; and Greschner, Johann, 4,334,156, Cl. 250-491.000.
Nelson, M. Eugene. Power operated reclining wheelchair. 4,333,681, Cl. 297-83.000.
Nelson, Stephen J., to Upjohn Company, The. Preparation of N-chlorothio(methyl)carbamoyl halides. 4,333,883, Cl. 260-544.00C.
Nelson, Terence J.: *See*—
Geusic, Joseph E.; Muehlner, Dirk J.; and Nelson, Terence J., 4,334,291, Cl. 365-36.000.
Nemoto, Yousui: *See*—
Fujita, Taketoshi; Ohgi, Yasuyuki; and Nemoto, Yousui, 4,334,035, Cl. 525-34.000.
NESPAK S.p.A. Societa' Generale per l'Imballaggio: *See*—
Martelli, Nerio, 4,333,571, Cl. 206-499.000.
Neumann, Harry C.; and Skiba, Frank G., to Western Electric Company, Inc. Wire weldment deflashing tool. 4,333,214, Cl. 29-80.000.

Neuzil, Richard W.; and Fergin, Richard L., to UOP Inc. Extraction of sucrose from molasses. 4,333,770, Cl. 127-46.300.
Neuzil, Richard W.: *See—*
Kulprathipanja, Santi; and Neuzil, Richard W., 4,333,769, Cl. 127-46.200.
Neves, Alan M. Blended ethanol fuel. 4,333,739, Cl. 44-52.000.
New York Institute of Technology: *See—*
Nigam, Anant K., 4,333,474, Cl. 128-660.000.
Newell Research Corporation: *See—*
Seaman, William E., 4,333,618, Cl. 242-192.000.
Ngo, Peter D. T.: *See—*
Boyd, Gary D.; Cheng, Julian; and Ngo, Peter D. T., 4,333,708, Cl. 350-346.000.
Nguyen, Tuan A.: *See—*
Sullivan, Richard W.; and Nguyen, Tuan A., 4,333,246, Cl. 34-23.000.
Nichols-Homeshield, Inc.: *See—*
DePaolo, James F.; Hale, Joseph T.; and Holmberg, Carl F., 4,333,271, Cl. 49-464.000.
Nickel, Horst; Muller, Friedhelm; and Mummenhoff, Peter, to Bayer Aktiengesellschaft. Cationic triazinylamino azo dyestuffs. 4,333,874, Cl. 260-153.000.
Nield, Barry J.; and Earnshaw, Roy R., to Rig Electronics Ltd. Electronic control indicator for cable hoist equipment. 4,334,217, Cl. 340-685.000.
Niemeyer, Matthias: *See—*
Herbst, Heiner; and Niemeyer, Matthias, 4,334,239, Cl. 358-44.000.
Niezgoda, Thomas A.; and Oppenheimer, Carl P., to Acoustic Standards. Tone generation system for electronic musical instrument. 4,333,377, Cl. 84-1.270.
Nigam, Anant K., to New York Institute of Technology. Ultrasonic imaging system. 4,333,474, Cl. 128-660.000.
Nihon-Hammond Kabushiki Kaisha: *See—*
Sogoh, Kiyoshi, 4,333,375, Cl. 84-1.010.
Nippon Electric Co., Ltd.: *See—*
Kawakita, Kenji; Makino, Takenori; and Harada, Norio, 4,334,285, Cl. 364-761.000.
Morishita, Masanobu; and Tanaka, Takanori, 4,334,238, Cl. 358-43.000.
Nagami, Akira, 4,334,295, Cl. 365-222.000.
Tanaka, Motomichi, 4,334,316, Cl. 455-139.000.
Yoshida, Yasuharu, 4,334,312, Cl. 375-20.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Okumura, Takatoshi; Nakada, Akira; Uchiyama, Yasuji; Aoki, Eiichiro; Yamaga, Eiichi; and Oya, Akiyoshi, 4,333,374, Cl. 84-1.010.
Nippon Oil Company, Ltd.: *See—*
Kojima, Ichiro; Maruhashi, Kenji; and Fujiwara, Yasuo, 4,334,021, Cl. 435-118.000.
Nippon Shinyaku Co., Ltd.: *See—*
Matsumura, Shingo; Enomoto, Hiroshi; Aoyagi, Yoshiaki; and Shibata, Yoshihisa, 4,333,933, Cl. 424-249.000.
Ohata, Katsuya; Nomura, Tadatoshi; and Watanabe, Masayoshi, 4,333,926, Cl. 424-182.000.
Nishimura, Yukuo: *See—*
Shirato, Yoshiaki; Takatori, Yasushi; Hara, Toshitami; Nishimura, Yukuo; and Takahashi, Michiko, 4,334,234, Cl. 346-140.00R.
Nishizawa, Jun-Ichi; and Kimura, Kitsuhiro, to Semiconductor Research Foundation. Sapphire single crystal substrate consisting essentially of Ga_2O_3 for semiconductor devices. 4,333,989, Cl. 428-446.000.
Nishizawa, Jun-ichi, to Zaidan Hojin Handotai Kenkyu Shinkokai. Insulated gate type semiconductor device. 4,334,235, Cl. 357-23.000.
Nishizawa, Yasuo, to Hitachi, Ltd. Reactor power control apparatus. 4,333,797, Cl. 376-210.000.
Nissan Motor Company, Limited: *See—*
Izumi, Masao, 4,334,255, Cl. 361-22.000.
Nakajima, Yasuo; and Kikuchi, Kazuhiro, 4,333,334, Cl. 73-35.000.
Shimada, Yukio; Suzuki, Naoyoshi; Ohashi, Toshio; and Inoshita, Yasushi, 4,333,606, Cl. 237-12.30A.
Tanaka, Toshiaki; and Etoh, Yukihiro, 4,333,428, Cl. 123-198.00F.
Nobue, Michio: *See—*
Konoki, Keizo; Nobue, Michio; Fukui, Akito; and Inoue, Shigeru, 4,334,096, Cl. 564-72.000.
Nojima, Nobuo, to Nojimagumi Co., Ltd. Sand-blasting abrasive materials and method of producing the same. 4,333,743, Cl. 51-298.000.
Nojimagumi Co., Ltd.: *See—*
Nojima, Nobuo, 4,333,743, Cl. 51-298.000.
Nomura, Tadatoshi: *See—*
Ohata, Katsuya; Nomura, Tadatoshi; and Watanabe, Masayoshi, 4,333,926, Cl. 424-182.000.
Nonaka, Takeyoshi; and Otsuka, Kazuo, to Shinko Electric Co., Ltd. Photoelectric control system for parts orientation. 4,333,558, Cl. 198-391.000.
Nooi, Jacobus R.: *See—*
Duggleby, Peter M.; Foster, Francis G.; and Nooi, Jacobus R., 4,333,844, Cl. 252-97.000.
Nordnero AB: *See—*
Karlsson, Tom O. B.; and Larsson, Hans M., 4,333,485, Cl. 134-60.000.
Norlin Industries, Inc.: *See—*
Luce, David A., 4,334,195, Cl. 328-168.000.
Moore, Douglas R.; and Swain, Richard S., 4,333,376, Cl. 84-1.270.
Norris Industries, Inc.: *See—*
Dietrich, Hagen; and Fane, William J., 4,333,324, Cl. 70-107.000.
Norris, Robert L., Sr. Energized range burner signal. 4,334,145, Cl. 219-453.000.
Novak, Pavel: *See—*
Bramm, Guenter; and Novak, Pavel, 4,334,180, Cl. 318-687.000.
NTN Toyo Bearing Company, Limited: *See—*
Nakazeki, Tsugito; and Harada, Haruhisa, 4,333,435, Cl. 123-489.000.
Nukem GmbH: *See—*
Lang, Raimund; Quittkat, Jorg; Fischer, Gert; and Lather, Dieter, 4,333,347, Cl. 73-642.000.
Numbers, Jody L.: *See—*
Byers, Charles M.; and Numbers, Jody L., 4,333,401, Cl. 102-487.000.
Nye, LaVonne, to B&B Miniatures, The Whimsey. Method for pleating cloth. 4,333,252, Cl. 38-144.000.
Nyfeler, Robert: *See—*
Sturm, Elmar; and Nyfeler, Robert, 4,333,949, Cl. 424-300.000.
O'Brien, Dennis E., to UOP Inc. Separation of normally gaseous hydrocarbons from a catalytic reforming effluent and recovery of purified hydrogen. 4,333,817, Cl. 208-101.000.
Occidental Oil Shale Inc.: *See—*
Ricketts, Thomas E.; and Redpath, Bruce B., 4,333,684, Cl. 299-2.000.
Oda, Koichiro: *See—*
Ofuchi, Kunihiko; Oda, Koichiro; and Nakao, Kenichiro, 4,333,927, Cl. 424-238.000.
Oerlikon-Buhrle U.S.A. Inc.: *See—*
Sarcia, Domenico S., 4,333,755, Cl. 62-6.000.
Ofuchi, Kunihiko; Oda, Koichiro; and Nakao, Kenichiro, to Mitsubishi Chemical Industries, Ltd. Skin preparation. 4,333,927, Cl. 424-238.000.
Ogasawara, Makoto: *See—*
Urasaki, Takanori; Hirabayashi, Yasuji; Ogasawara, Makoto; and Inata, Hiroo, 4,333,907, Cl. 264-290.200.
Ogata, Hisanao: *See—*
Tada, Naofumi; Kimura, Hiroshi; and Ogata, Hisanao, 4,334,123, Cl. 174-15.00S.
Ogawa, Francis T.: *See—*
Adams, James R., Jr.; and Ogawa, Francis T., 4,333,718, Cl. 354-31.000.
Ogawa, Kazuo: *See—*
Takagi, Hidehiko; Hayashi, Hisao; Ogawa, Kazuo; and Kanaya, Yoshihiro, 4,334,137, Cl. 219-10.55F.
Ogawa, Norihiro: *See—*
Sugioka, Masumi; and Ogawa, Norihiro, 4,333,362, Cl. 74-812.000.
Ogawa, Ryota: *See—*
Itoh, Takayuki; Ogawa, Ryota; and Arai, Yasunori, 4,333,711, Cl. 350-426.000.
Ogilvie, Kelvin K., to Bio Logicals Inc. Silylated arabino-base compounds. 4,334,059, Cl. 536-23.000.
Oguma, Kiyoshi: *See—*
Tamai, Masaharu; Adachi, Takashi; Morimoto, Shigeo; Oguma, Kiyoshi; Hanada, Kazunori; and Omura, Sadafumi, 4,333,879, Cl. 549-549.000.
Ohashi, Toshio: *See—*
Shimada, Yukio; Suzuki, Naoyoshi; Ohashi, Toshio; and Inoshita, Yasushi, 4,333,606, Cl. 237-12.30A.
Ohata, Katsuya; Nomura, Tadatoshi; and Watanabe, Masayoshi, to Nippon Shinyaku Co., Ltd. Steryl-β-D-glucoside pharmaceutical compositions and use. 4,333,926, Cl. 424-182.000.
Ohgi, Yasuyuki: *See—*
Fujita, Taketoshi; Ohgi, Yasuyuki; and Nemoto, Yousui, 4,334,035, Cl. 525-34.000.
Ohline Corporation: *See—*
Conn, William H., 4,333,509, Cl. 160-173.000.
Ohmori, Hideyo: *See—*
Naito, Hiroyuki; Maruya, Takashi; Gotoh, Kyugo; and Ohmori, Hideyo, 4,334,029, Cl. 501-109.000.
Ohnmacht, Helmut: *See—*
Roller, Hanno; Ohnmacht, Helmut; Lieber, Ludwig; and Nauerth, Karl-Heinz, 4,334,141, Cl. 219-283.000.
Ohno, Norio: *See—*
Hashimoto, Katsuhiko; Nambu, Hirohiko; Watari, Kazuhiro; Mizuno, Kenichi; Murakami, Tadateru; Matsuoka, Yutaka; Moriyama, Mitsutoshi; and Ohno, Norio, 4,334,108, Cl. 568-803.000.
Ohno, Sachio; Nagasaka, Mitsuaki; and Kato, Kazuo, to Maruko Seiyaku Co., Ltd. Flavan compounds and acid addition salts thereof. 4,334,067, Cl. 544-151.000.
Ohno, Syotaro: *See—*
Koyama, Kenji; Ohno, Syotaro; and Fukuda, Mitsutoshi, 4,333,870, Cl. 260-112.00B.
Ohta, Hirofumi: *See—*
Hiroshima, Minoru; Futami, Toshio; and Ohta, Hirofumi, 4,334,290, Cl. 365-1.000.
Ohtani, Mitsuhiro: *See—*
Aoki, Masaki; and Ohtani, Mitsuhiro, 4,333,861, Cl. 252-518.000.
Okajima, Yakutaro; and Sekigawa, Keiji, to Warner-Lambert Company. Capsule and process for the production of a colored gelatin capsule. 4,333,957, Cl. 426-140.000.
Okamoto, Miyoshi; and Fushida, Mineto, to Toray Industries, Incorporated. Composite woven or knitted fabric. 4,333,976, Cl. 428-91.000.
Okamoto, Takeshi: *See—*
Minagawa, Shoichi; and Okamoto, Takeshi, 4,334,167, Cl. 310-313.00R.
Okamura, Kiyohito: *See—*
Yajima, Seishi; Okamura, Kiyohito; and Shishido, Toetsu, 4,334,051, Cl. 528-25.000.

Okumura, Takatoshi; Nakada, Akira; Uchiyama, Yasuji; Aoki, Eiichiro; Yamaga, Eiichi; and Oya, Akiyoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Submultiple-related-frequency wave generator. 4,333,374, Cl. 84-1.010.

Olin Corporation: *See—*
Combette, Marc; and Ollivier, Jean, 4,333,595, Cl. 227-10.000.
Dotson, Ronald L.; and Carr, Edward P., 4,333,913, Cl. 423-184.000.

Oliver, James K.: *See—*
Ikin, David D.; Butler, Paul G.; Sassella, Christopher D.; and Oliver, James K., 4,333,525, Cl. 165-104.210.

Ollivier, Jean: *See—*
Combette, Marc; and Ollivier, Jean, 4,333,595, Cl. 227-10.000.

Olson, Gary L.: *See—*
Berger, Leo; and Olson, Gary L., 4,334,070, Cl. 546-70.000.

Olympus Optical Company Limited: *See—*
Furuta, Kenji, 4,334,149, Cl. 235-92.0MP.
Motoyama, Kazuyasu; and Kato, Toshikazu, 4,334,253, Cl. 360-137.000.
Sakurai, Yoshifumi, 4,333,991, Cl. 428-702.000.
Sato, Masaaki, 4,334,251, Cl. 360-96.600.

O'Meara, David M.: *See—*
Bellafiore, Francis V.; Duff, Michael P.; and O'Meara, David M., 4,333,973, Cl. 427-424.000.

Omura, Sadafumi: *See—*
Tamai, Masaharu; Adachi, Takashi; Morimoto, Shigeo; Oguma, Kiyoshi; Hanada, Kazunori; and Omura, Sadafumi, 4,333,879, Cl. 549-549.000.

O'Neill, Joseph L.; and Scafidi, Christopher J., to Infotron Systems Corporation. Plural edge P.C. board interconnection. 4,333,696, Cl. 339-17.0LM.

Onishi, Heizo, to Brother Kogyo Kabushiki Kaisha. Ultrasonic seam welding apparatus. 4,333,791, Cl. 156-580.100.

Ono, Hiroshi; and Mizoi, Kazutoshi, to Gen Engineering, Ltd. Wireless transmitting and receiving systems including ear microphones. 4,334,315, Cl. 455-11.000.

Onofrio, David A., to Ford Motor Company. Carburetor accelerator pump stroke control. 4,333,888, Cl. 261-34.00B.

Oodera, Shigeyuki: *See—*
Yoshida, Hiroshi; Hagiwara, Isao; and Oodera, Shigeyuki, 4,333,903, Cl. 264-165.000.

Ooki, Norihiro; Motegi, Shoji; and Watanabe, Masatoshi, to Hitachi, Ltd. Slip ring cooling devices for electrical rotary machines. 4,334,159, Cl. 310-54.000.

Oomura, Etsuji; Murotani, Toshio; and Ishii, Makoto, to Mitsubishi Denki Kabushiki Kaisha. Transverse junction stripe semiconductor laser device. 4,334,311, Cl. 372-47.000.

Opitz, Konrad: *See—*
Deubel, Reinhold; Opitz, Konrad; Kruse, Hubert; Schneider, Manfred; and Uhrig, Heinz, 4,333,732, Cl. 8-527.000.

Oppenheimer, Carl P.: *See—*
Niezgoda, Thomas A.; and Oppenheimer, Carl P., 4,333,377, Cl. 84-1.270.

Optical Coating Laboratory, Inc.: *See—*
Allen, Thomas H., 4,333,983, Cl. 428-336.000.

Oros, Gerald D. Globe clock device and methods of making and using the same. 4,334,297, Cl. 368-18.000.

Orr, David A.; Gala, Hiren S.; and Scagnelli, George J., to Talon, Inc. Apparatus for forming flypiece and slide fastener chain assembly. 4,333,232, Cl. 29-767.000.

Osawa, Tadao: *See—*
Karino, Kimiji; Osawa, Tadao; Nagano, Masami; Sakuma, Tokihiko; Kanazawa, Yuiti; Kuroha, Tunemitu; and Tachibana, Kanji, 4,333,890, Cl. 261-41.00D.

Osthaus, Georg: *See—*
Zucker, Friedrich J.; Osthaus, Georg; and Zucker-Kerbler, Doris, 4,333,611, Cl. 241-1.000.

Otao, Kazumasa, to Trio Kabushiki Kaisha. Power amplifier circuitry. 4,334,197, Cl. 330-268.000.

Otis Elevator Company: *See—*
Davis, Meredith R., 4,333,549, Cl. 187-93.000.

Otis Engineering Corporation: *See—*
Higgins, Robert S.; and Merritt, David T., 4,333,527, Cl. 166-117.500.

Otsuka Kagaku Yakuhin Kabushiki Kaisha: *See—*
Shimizu, Yasuo; Takao, Hisashi; Asano, Shoji; Shimada, Shuya; and Kikkawa, Kazutoshi, 4,334,066, Cl. 544-149.000.

Otsuka, Kazuo: *See—*
Nonaka, Takeyoshi; and Otsuka, Kazuo, 4,333,558, Cl. 198-391.000.

Otten, Jay G.; Heyman, Duane A.; and Murphy, John R., to BASF Wyandotte Corporation. Flame-retardant polyurethane foam prepared by incorporating a graft polymer having a particle size greater than 0.5 micron. 4,334,031, Cl. 521-106.000.

Overlach, Knut: *See—*
Pietzsch, Ludwig; Overlach, Knut; and Eberhard, Hans J., 4,333,543, Cl. 177-134.000.

Owen, Geoffrey R.: *See—*
Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., 4,333,946, Cl. 424-273.00R.

Owens-Corning Fiberglas Corporation: *See—*
McCort, Ralph E., 4,333,369, Cl. 83-24.000.
Musgrave, Dwight S.; McMahan, John D.; and Downing, Robert L., 4,333,291, Cl. 52-404.000.
Musgrave, Dwight S., 4,333,292, Cl. 52-404.000.
Uffner, William E., 4,333,866, Cl. 524-534.000.

Owens-Illinois, Inc.: *See—*
Heider, James E., 4,333,570, Cl. 206-432.000.
Mumford, George V., 4,333,577, Cl. 215-246.000.

Oy. Tampella AB: *See—*
Haikkala, Pekka O., 4,333,613, Cl. 241-34.000.

Oy Wartsila AB: *See—*
Koutonen, Pauli; and Alanco, Lars-Erik, 4,333,301, Cl. 53-587.000.

Oya, Akiyoshi: *See—*
Okumura, Takatoshi; Nakada, Akira; Uchiyama, Yasuji; Aoki, Eiichiro; Yamaga, Eiichi; and Oya, Akiyoshi, 4,333,374, Cl. 84-1.010.

Pabodie, Robert M.: *See—*
Hamisch, Paul H., Jr.; and Pabodie, Robert M., 4,333,399, Cl. 101-401.200.

Pack, Gary D.; and Weaver, Frederick D., to Mead Corporation, The. Encapsulation process. 4,333,849, Cl. 252-316.000.

Paetz, James E.: *See—*
Camp, Neal H.; Paetz, James E.; and Patterson, Nicholas L., 4,333,417, Cl. 118-50.000.

Palladino, Nicola: *See—*
Mantovani, Elvio; Palladino, Nicola; and Zanobi, Antonio, 4,334,101, Cl. 568-454.000.

Paluch, Bernard R. Positive pressure breathing apparatus with condensate removal. 4,333,451, Cl. 128-205.120.

Panafacom Limited: *See—*
Shibasaki, Yoshihisa; Sakamura, Ken; Sakamae, Waichi; Nakano, Koichi; and Aiso, Hideo, 4,334,269, Cl. 364-200.000.

Panduit Corp.: *See—*
Guzay, Casimir M.; and Wright, James A., 4,333,633, Cl. 251-320.000.

Pangritz, Dirk, to B.A.T. Cigaretten-Fabriken GmbH. Apparatus for determining the burning and/or glowing rates of a smokable article. 4,333,333, Cl. 374-8.000.

Panlaqui, Clayton E.: *See—*
Holt, Lloyd J.; and Panlaqui, Clayton E., 4,333,382, Cl. 89-1.806.

Parekh, Manher: *See—*
Patton, John T., Jr.; Vogt, Herwart C.; and Parekh, Manher, 4,334,052, Cl. 528-52.000.

Parker, Walter E.: *See—*
Gavasso, John M.; Bodnar, Louis G.; and Parker, Walter E., 4,333,426, Cl. 123-90.270.

Parks-Cramer Company: *See—*
Mulligan, William L.; and House, Thomas R., 4,333,772, Cl. 134-18.000.

Parman, Dan F.; Wiebush, LeMoey M.; Shaw, Fred M.; and Cummins, James P., to Power Controls Corporation. Light dimmer switch having remote load current switching. 4,334,171, Cl. 315-199.000.

Parro, James. Heat exchange method using natural flow of heat exchange medium. 4,333,517, Cl. 165-1.000.

Patel, Naren I.: *See—*
Davis, Lawrence E.; and Patel, Naren I., 4,333,706, Cl. 350-96.230.

Patey, Daniel F.; and Doyle, Paul M., to Lucas Industries Limited. Fuel pump test equipment. 4,333,338, Cl. 73-119.00A.

Patterson, Nicholas L.: *See—*
Camp, Neal H.; Paetz, James E.; and Patterson, Nicholas L., 4,333,417, Cl. 118-50.000.

Patton, John T., Jr.; and Vogt, Herwart C., to BASF Wyandotte Corporation. Foamed polymers containing low molecular weight urethane modifier compound. 4,334,032, Cl. 521-115.000.

Patton, John T., Jr.; Vogt, Herwart C.; and Parekh, Manher, to BASF Wyandotte Corporation. Rigid, non-cellular polyurethane modified with reaction product of an isocyanate and an alcohol. 4,334,052, Cl. 528-52.000.

Paulus, Rudolf; and Mischo, Klaus, to AGFA-Gevaert AG. Operation setting device having stationary touch-sensitive control elements. 4,334,219, Cl. 340-712.000.

Payne, Thomas R., to General Electric Company. Power control for appliance using high inrush current element. 4,334,147, Cl. 219-497.000.

Peche, Gerhard: *See—*
Gebel, Rudolf; Peche, Gerhard; Schindler, Heinrich; and Welly, Jurgen-Dietrich, 4,334,133, Cl. 200-279.000.

Pellegrini, John P., Jr.; Beach, David L.; and Kobylinski, Thaddeus P., to Gulf Research & Development Company. Synthetic hydrocarbon oligomers. 4,334,113, Cl. 585-18.000.

Pennwalt Corporation: *See—*
Groepper, Jurgen, 4,334,043, Cl. 525-370.000.

Peppers, James M. Flexible recording disc stabilizing and guidance system. 4,334,302, Cl. 369-261.000.

Pepsico, Inc.: *See—*
Roy, Siegfried S., 4,333,629, Cl. 249-119.000.

Perez, Jean; and Carnus, Jean-Claude, to Automobiles Peugeot; and Societe Anonyme Automobiles Citroen. Device for recycling exhaust gases for a diesel engine. 4,333,438, Cl. 123-569.000.

Peroutka, Fritz; and Hirschfelder, Helmut, to Voith S.A. Cellular drum filter for the dewatering of fiber suspensions. 4,333,836, Cl. 210-404.000.

Perrin, Richard J.: *See—*
Magill, Robert J.; Lockley, Donald J.; and Perrin, Richard J., 4,333,489, Cl. 137-77.000.

Perry, Robert G. Power pipe tongs. 4,333,365, Cl. 81-57.160.

Persson, Karl-Johan: *See—*
Bengtsson, Erik; Billingsson, Nils; Persson, Karl-Johan; and Backman, Bengt-Olov, 4,334,110, Cl. 568-932.000.

Peter, Emmett B., III, to Burroughs Corporation. Duplex printing/paper handling apparatus for cut sheet printing. 4,333,641, Cl. 271-289.000.

Peter, Joseph E., to Vortec Corporation. Anti-icing noise-suppressing vortex tube assembly. 4,333,754, Cl. 62-5.000.

Peters, Kenneth R., to American Stabilis, Inc. Variable input-resistance power supply circuit. 4,333,605, Cl. 236-78.00R.

Peterson, Carl R.: *See—*
McNelia, John F.; and Peterson, Carl R., 4,333,400, Cl. 102-348.000.

Peterson, Marvin L., to Conoco Inc. Compression stressed weld joints on offshore platforms. 4,333,725, Cl. 403-271.000.

Peterson, Russell R., to Dow Chemical Company, The. Method of recovering 3,6-dichloropicolinic acid from basic aqueous solutions of salts thereof. 4,334,074, Cl. 546-327.000.

Petit, Alain: *See—*
Moisset, Jacques; Bonet, Claude; Rouanet, Alain; Petit, Alain; and Delmas, Robert, 4,333,766, Cl. 106-100.000.

Petri, Nello J. Glue applicator. 4,333,420, Cl. 118-411.000.

Petrillo, Gary M. Economic energy control. 4,333,604, Cl. 236-46.00R.

Petrolite Corporation: *See—*
Naiman, Michael I.; and Buriks, Rudolf S., 4,333,741, Cl. 44-62.000.

Pettigrew, James P.: *See—*
Lemmon, Ernest M.; and Pettigrew, James P., 4,333,688, Cl. 301-36.00R.

Petzinger, Manfred W. A. Evaporation septic tank sewage system. 4,333,831, Cl. 210-170.000.

Pews, R. Garth: *See—*
Davis, Ralph A.; and Pews, R. Garth, 4,334,111, Cl. 570-143.000.

Pfeilsticker, Robert. Tennis practice and training aid. 4,333,646, Cl. 273-29.00A.

Pfizer Inc.: *See—*
Belletire, John L., 4,333,932, Cl. 424-248.560.

Pfleiderer, Hans-Joerg: *See—*
Herbst, Heiner; Pfleiderer, Hans-Joerg; and Grassl, Hans-Peter, 4,334,150, Cl. 250-201.000.
Herbst, Heiner; Pfleiderer, Hans-Joerg; and Grassl, Hans-Peter, 4,334,151, Cl. 250-201.000.

Pham, Minh-Chau: *See—*
Dubois, Jacques E.; Pham, Minh-Chau; and Lacaze, Pierre C., 4,334,054, Cl. 528-210.000.

Philip Morris Incorporated: *See—*
Banyasz, Joseph L., 4,333,482, Cl. 131-300.000.
de la Burde, Roger Z.; Aument, Patrick E.; and Utsch, Francis V., 4,333,483, Cl. 131-352.000.
Keritsis, Gus D., 4,333,484, Cl. 131-359.000.

Phillips Petroleum Company: *See—*
Broerman, Arthur B., 4,333,500, Cl. 137-863.000.
Cobb, Raymond L., 4,334,115, Cl. 585-407.000.
Gardner, Lloyd E.; Farha, Floyd E., Jr.; Eastman, Alan D.; and Drehman, Lewis E., 4,333,855, Cl. 252-439.000.
Hawley, Gil R.; and McDaniel, Max P., 4,333,860, Cl. 252-458.000.

Phillips, Robert A.: *See—*
Baratz, Brenda S.; Phillips, Robert A.; and Steward, David L., 4,333,941, Cl. 424-267.000.

Piccardi, Paolo: *See—*
Bettarini, Franco; Massardo, Pietro; Piccardi, Paolo; and Longoni, Angelo, 4,334,104, Cl. 568-649.000.

Pieniak, Heinz A., to Johnson & Johnson Baby Products Company. Method of making laminated structures having gathered and ungathered marginal portions. 4,333,782, Cl. 156-164.000.

Piesinger, Gregory H.: *See—*
Turney, William J.; and Piesinger, Gregory H., 4,334,185, Cl. 323-280.000.

Pietzsch, Ludwig; Overlach, Knut; and Eberhard, Hans J., to Pietzsch, Ludwig. Wheel or axle load measuring device for road vehicles. 4,333,543, Cl. 177-134.000.

Pin-Huang, Lin, to Te-Son, Chen. Wall-clambering toy space bug. 4,333,259, Cl. 46-132.000.

Pioneer Electronic Corporation: *See—*
Adachi, Hiroo, 4,334,263, Cl. 363-25.000.
Kanamaru, Hitoshi, 4,334,301, Cl. 369-116.000.
Shimada, Kunihiko; and Tsuchiya, Yukio, 4,334,127, Cl. 179-115.50R.

Pitney Bowes Inc.: *See—*
Chang, Mike S. H.; Donoghue, John T.; and Edelman, Peter G., 4,334,000, Cl. 430-58.000.

Plamper, Gerhard R., to MTD Products Inc. Clutch and brake mechanism. 4,333,303, Cl. 56-11.300.

Plati, John T.: *See—*
Berger, Leo; Plati, John T.; and Ziering, Albert, 4,334,078, Cl. 549-43.000.

Platt, John D., to A.R.M. Access identification apparatus. 4,333,328, Cl. 70-278.000.

Plessey Incorporated: *See—*
Dakin, John P.; and Kahn, David A., 4,334,152, Cl. 250-226.000.

Plessey Mandel und Investments A.G.: *See—*
Mead, John F., 4,333,705, Cl. 350-96.200.

PLM AB: *See—*
Jakobsen, Kjell M., 4,333,904, Cl. 264-323.000.

Plosz, Sandor; Babos, Katalin; Rozsavolgyi, Karoly; and Felfoldy, Lajos, to Varosepitesi Tudomanyos es TervezoIntezet. Water purification process and apparatus. 4,333,837, Cl. 210-602.000.

Plotkin, George M.; and Wolf, George, to Massachusetts Institute of Technology. Method for detecting cancer in mammalian tissue. 4,334,017, Cl. 435-7.000.

Podhrasky, Robert J., to Garrett Electronics. Metal detector circuit having momentary disabled output. 4,334,191, Cl. 324-329.000.

Podhrasky, Robert J., to Garrett Electronics. Metal detector circuit having automatic tuning with multiple rates. 4,334,192, Cl. 324-329.000.

Poff, David A.: *See—*
Gordy, Lester A.; and Poff, David A., 4,334,193, Cl. 324-437.000.

Polazzi, Joseph O.: *See—*
Kotick, Michael P.; and Polazzi, Joseph O., 4,334,071, Cl. 546-74.000.

Politechnika Warszawska: *See—*
Przyluski, Jan; Madry, Kazimierz; Dolecki, Zbigniew; Kotarski, Andrzej; Drygas, Maria; Kokosinski, Jacek; Kuzma, Zygmunt; and Chelminski, Bohdan, 4,333,802, Cl. 204-54.00R.

Ponder, James E., to Texas Instruments Incorporated. Semiconductor memory cell with clocked voltage supply from data lines. 4,334,293, Cl. 365-190.000.

Pontagnier, Henri: *See—*
Creuzet, Marie-Helene; Feniou, Claude; Prat, Gisele; and Pontagnier, Henri, 4,333,938, Cl. 424-263.000.

Poole, William F., to General Electric Company. Switch with shaft positioning arrangement. 4,334,132, Cl. 200-153.0LB.

Poponiak, Michael R.: *See—*
Horng, Cheng T.; Poponiak, Michael R.; Rupprecht, Hans S.; and Schwenker, Robert O., 4,333,227, Cl. 29-580.000.

Popper, Karel. Deodorizing methods and articles using ion exchange manufacture. 4,333,183, Cl. 2-400.000.

Porta Systems Corp.: *See—*
De Luca, Paul V.; Gazzo, John J.; and Hollfelder, Thomas A., 4,334,129, Cl. 179-175.110.

Porter, Christopher H.; and Taylor, John A., to Extracorporeal Medical Specialties, Inc. Process for producing hollow fibers having a non-uniform wall thickness and a non-uniform cross-sectional area. 4,333,906, Cl. 264-40.300.

Porter, Thomas M., to H. K. Porter, Inc. Spreader tool. 4,333,330, Cl. 72-392.000.

Post, Sieghard, to U.S. Philips Corporation. Coil former for a transformer. 4,334,208, Cl. 336-192.000.

Potash, Hanan, to Burroughs Corporation. Circuit for addressing binarily addressable memories with BCD addresses. 4,334,213, Cl. 340-347.0DD.

Power Controls Corporation: *See—*
Parman, Dan F.; Wiebush, LeMoey M.; Shaw, Fred M.; and Cummins, James P., 4,334,171, Cl. 315-199.000.

Power-Matic Corporation: *See—*
Gogins, Laird B., 4,333,555, Cl. 192-58.00R.

PPG Industries, Inc.: *See—*
Crico, Aurelio M., 4,333,799, Cl. 203-67.000.
Neely, James E., Jr.; Lin, Chia-Cheng; Falleroni, Charlene A.; and Moff, Annette, 4,333,914, Cl. 423-314.000.

Prat, Gisele: *See—*
Creuzet, Marie-Helene; Feniou, Claude; Guichard, Francoise; and Prat, Gisele, 4,333,930, Cl. 424-248.510.
Creuzet, Marie-Helene; Feniou, Claude; Prat, Gisele; and Pontagnier, Henri, 4,333,938, Cl. 424-263.000.

Pray, Winston C., to Flexible Steel Lacing Company. Apparatus for stapling belt. 4,333,217, Cl. 29-243.510.

Preuss, Wolfgang; Bahn, Michael; Schmid, Rolf; and Wagner, Rudiger, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). 3-Oxo-pregna-1,14,17-trien-20-carboxylates and process. 4,333,880, Cl. 260-397.100.

Prevorsek, Dusan C.: *See—*
Wu, Tse C.; Prevorsek, Dusan C.; and Wertz, David H., 4,334,045, Cl. 525-439.000.

Priegnitz, James W., to UOP Inc. Process for the separation of water from ethanol. 4,333,740, Cl. 44-56.000.

Priepke, Edward H.: *See—*
Greiner, James G.; Lehman, Joseph J.; and Priepke, Edward H., 4,333,304, Cl. 56-119.000.

Priestley, Ronald: *See—*
Ellis, Stephen R. M.; and Priestley, Ronald, 4,333,892, Cl. 261-94.000.

Princiotta, Raymond A. Garment hanger. 4,333,590, Cl. 223-85.000.

Privalov, Petr L. Differential scanning microcalorimeter. 4,333,332, Cl. 374-10.000.

Procter & Gamble Company, The: *See—*
Smith, Rory J. M.; and McRitchie, Aalan C., 4,333,862, Cl. 252-547.000.

Przyluski, Jan; Madry, Kazimierz; Dolecki, Zbigniew; Kotarski, Andrzej; Drygas, Maria; Kokosinski, Jacek; Kuzma, Zygmunt; and Chelminski, Bohdan, to Politechnika Warszawska. Method of electrochemical obtaining of bright tin coatings. 4,333,802, Cl. 204-54.00R.

Pugh, William E., III, to Bell Telephone Laboratories, Incorporated. Insulation-penetrating slotted beam contact element. 4,333,700, Cl. 339-97.00R.

Pujado, Peter R., to UOP Inc. Recovery of a cumene/alpha-methylstyrene fraction from a mixture thereof with phenol and water. 4,333,801, Cl. 203-94.000.

Pujari, Vimal K.: *See—*
Frost, Rodney I.; McBrayer, Robert D.; and Pujari, Vimal K., 4,333,518, Cl. 165-8.000.

Pulker, Hans K.; and Daxinger, Helmut, to Balzers Aktiengesellschaft. Method for producing gold color coatings. 4,333,962, Cl. 427-37.000.

Punis, Giancarlo: *See—*
Connery, James G.; Diascro, Dominick D.; DiNapoli, Louis D.; Punis, Giancarlo; and Matour, Anthony J., 4,333,352, Cl. 73-861.180.
Puropore, Inc.: *See—*
Kesting, Robert E., 4,333,972, Cl. 427-244.000.
Quast, Kenneth J.: *See—*
Rice, John F.; Yundt, Albert P.; and Quast, Kenneth J., 4,334,008, Cl. 430-270.000.
Queener, Carl A.: *See—*
Davidge, Ronald V.; Queener, Carl A.; and Vanderslice, James T., 4,333,639, Cl. 271-3.100.
Quinto, Dennis T.: *See—*
Bhattacharya, Debanshu; Quinto, Dennis T.; and Holowaty, Michael O., 4,333,776, Cl. 148-36.000.
Quinton, Gary F.: *See—*
Smith, Dean C.; and Quinton, Gary F., 4,333,234, Cl. 30-2.000.
Quittkat, Jorg: *See—*
Lang, Raimund; Quittkat, Jorg; Fischer, Gert; and Lather, Dieter, 4,333,347, Cl. 73-642.000.
Rabian, Jean M.: *See—*
Nard, Georges P.; Bourasseau, Daniel J. E.; and Rabian, Jean M., 4,334,314, Cl. 375-111.000.
Raddatz, John A., to Minnesota Mining and Manufacturing Company. Hanger assembly. 4,333,624, Cl. 248-205.00R.
Rakhit, Sumanas; and Bagli, Jehan F., to American Home Products Corp. 2-(Piperazinyl)-4-pyrimioinamines. 4,333,937, Cl. 424-251.000.
Ramlow, Gerhard G.; Heyman, Duane A.; and Moore, Richard A., to BASF Wyandotte Corporation. Process for the preparation of finely divided solid polymers in polyol. 4,334,049, Cl. 526-202.000.
Rand, Edward R., to Lainiere de Picardie. Fusible interlining of a textile sheet and a heat-sealable film for washable garments. 4,333,982, Cl. 428-245.000.
Randell, Donald R.: *See—*
Schmidt, Andreas; Kirchmayr, Rudolf; and Randell, Donald R., 4,333,841, Cl. 252-32.70E.
Rank Organisation Limited, The: *See—*
Whitehouse, David J., 4,334,282, Cl. 364-728.000.
Ratigan, Brian: *See—*
Longley, Karl E.; Ratigan, Brian; and Davis, James W., 4,333,833, Cl. 210-198.100.
Raychem Corporation: *See—*
Kampe, Andrew J., 4,334,148, Cl. 219-553.000.
Raymond Engineering Inc.: *See—*
Bickford, John H., 4,333,351, Cl. 73-761.000.
RCA Corporation: *See—*
Hoover, Merle V., 4,334,324, Cl. 455-333.000.
Malchow, Max E., 4,334,198, Cl. 330-296.000.
Marder, William Z., 4,333,592, Cl. 226-52.000.
Miko, Sandor, 4,334,267, Cl. 363-133.000.
Reitmeier, Glenn A.; and Dischert, Robert A., 4,334,237, Cl. 358-36.000.
Schade, Otto H., Jr., 4,334,196, Cl. 330-253.000.
Redpath, Bruce B.: *See—*
Ricketts, Thomas E.; and Redpath, Bruce B., 4,333,684, Cl. 299-2.000.
Regehr, John L., to International Business Machines Corporation. Non impact display screen output printer. 4,334,231, Cl. 346-35.000.
Regie Nationale Des Usines Renault: *See—*
Bascou, Jacques, 4,333,269, Cl. 49-280.000.
Reick, Franklin G., to Ebert, Michael, a part interest. Hybrid PTFE lubricant for weapons. 4,333,840, Cl. 252-16.000.
Reinger, Friedrich: *See—*
Gieschen, Kurt; and Reinger, Friedrich, 4,334,155, Cl. 250-490.000.
Reinhart, Robert F.: *See—*
Corbin, Raymond L. R.; and Reinhart, Robert F., 4,333,279, Cl. 52-105.000.
Reinking, Klaus: *See—*
Freitag, Dieter; Reinking, Klaus; Idel, Karsten; Medem, Harald; and Bottenbruch, Ludwig, 4,334,053, Cl. 528-179.000.
Reist, Walter, to Ferag AG. Apparatus for infeeding flat products, especially printed products, arriving in an imbricated stream to a transport device. 4,333,559, Cl. 198-461.000.
Reitmeier, Glenn A.; and Dischert, Robert A., to RCA Corporation. Adaptive amplitude averaging for weighting quantizing noise. 4,334,237, Cl. 358-36.000.
Relvini, Pasquale: *See—*
Marciandi, Franco; and Relvini, Pasquale, 4,333,869, Cl. 524-100.000.
Renzel, Peter; and Kroesen, Klaus, to Krautkramer-Branson, Inc. Display of ultrasound test data. 4,333,345, Cl. 73-606.000.
Renzel, Peter, to Krautkramer-Branson, Inc. Display device for non-destructive testing apparatus. 4,333,346, Cl. 73-606.000.
Repco Research Pty. Ltd.: *See—*
Bouette, Rodger D., 4,334,002, Cl. 430-103.000.
Resnick, Paul R., to Du Pont de Nemours, E. I., and Company. Dialkyl perfluoro-ω-fluoroformyl diesters and monomers and polymers therefrom. 4,334,082, Cl. 560-180.000.
Reynolds Metals Company: *See—*
Kaplan, Howard I.; Bryce, Jerry H.; Johnston, Thomas J.; McMinn, Curtis J.; Willett, John T.; and Richards, Nolan E., 4,333,813, Cl. 204-243.00R.
Rhone-Poulenc Agrochimie: *See—*
Buathier, Bernard; and Bernard, Andre, 4,334,083, Cl. 560-226.000.
Rice, John F.; Yundt, Albert P.; and Quast, Kenneth J., to Bard Laboratories, Inc. Photosensitive compositions of polymer polynitrate ester and basic aromatic amine. 4,334,008, Cl. 430-270.000.
Richards, Nolan E.: *See—*
Kaplan, Howard I.; Bryce, Jerry H.; Johnston, Thomas J.; McMinn, Curtis J.; Willett, John T.; and Richards, Nolan E., 4,333,813, Cl. 204-243.00R.
Richardson, Edwin A., to Shell Oil Company. Nitrogen-gas-stabilized cement and a process for making and using it. 4,333,764, Cl. 106-87.000.
Richardson Graphics Company: *See—*
Jones, Thomas H., 4,334,003, Cl. 430-156.000.
Richner, Hans, to Hatebur Umformmaschinen AG. Cross transport press. 4,333,329, Cl. 72-3.000.
Ricketts, Thomas E.; and Redpath, Bruce B., to Occidental Oil Shale Inc. Method of uniform rubblization for limited void volume blasting. 4,333,684, Cl. 299-2.000.
Rieger, Franz: *See—*
Muller, Klaus; Maurer, Helmut; Rieger, Franz; and Linder, Ernst, 4,333,439, Cl. 123-569.000.
Rig Electronics Ltd.: *See—*
Nield, Barry J.; and Earnshaw, Roy R., 4,334,217, Cl. 340-685.000.
Ringer, William N.: *See—*
Chow, Peter C. M.; and Ringer, William N., 4,333,496, Cl. 137-489.000.
Ringwald, Erwin, to Sandoz Ltd. Thiazoline and imidazoline derivatives useful as minor tranquilizers. 4,333,945, Cl. 424-270.000.
Rinker, William R.; Ayers, Harry R.; and Miller, John W., to B. F. Goodrich Company, The. Apparatus and process for manufacturing bio-oxidation and nitrification modules. 4,333,779, Cl. 156-73.100.
Rinn Corporation: *See—*
Stevenson, Charles F., 4,333,254, Cl. 40-158.00B.
Rinnai Kabushiki Kaisha: *See—*
Takagi, Hidehiko; Hayashi, Hisao; Ogawa, Kazuo; and Kanaya, Yoshihiro, 4,334,137, Cl. 219-10.55F.
Rittenbach, Otto E., to United States of America, Army. Pulse train generator of predetermined pulse rate using feedback shift register. 4,334,194, Cl. 328-42.000.
Robbins, James M., to Jamestown Metal Mfg. Corp. Device for varying number of coins needed to permit operation of a coin-operated mechanism. 4,333,556, Cl. 194-92.000.
Robbins, Robert E.: *See—*
Woodward, James C.; and Holland, Marion D., 4,333,205, Cl. 15-345.000.
Robert Bosch GmbH: *See—*
Eheim, Franz, 4,333,440, Cl. 123-569.000.
Kopse, Odon; and Ziesche, Kurt, 4,333,436, Cl. 123-502.000.
Muller, Klaus; Maurer, Helmut; Rieger, Franz; and Linder, Ernst, 4,333,439, Cl. 123-569.000.
Robert Morton D.G. Limited: *See—*
Hancock, John C.; Winwood, John M.; and Wilkinson, Noel R., 4,333,393, Cl. 99-277.200.
Roberts, Peter, to Thrush Incorporated. Back-fire resistant lock seam for muffler shells. 4,333,545, Cl. 181-282.000.
Robinson, Brian, to Catnic Components Limited. Herringbone struts. 4,333,294, Cl. 52-695.000.
Robinson, Joseph G.; and Brain, Sally A., to Coal Industry (Patents) Limited. Resin derived from acenaphthene, process for its production and intermediates in its production. 4,334,055, Cl. 528-229.000.
Robinson, Martin A.: *See—*
Van De Puy, Michael; Anello, Louis G.; and Robinson, Martin A., 4,334,099, Cl. 568-386.000.
Rockerath, John L., to Cluett, Peabody & Co., Inc. Fabric label feeding means. 4,333,409, Cl. 112-121.270.
Rockwell International Corporation: *See—*
Searcy, Eugene S., 4,333,240, Cl. 33-174.00G.
Rockwell, Robert G., to Zenith Radio Corporation. Means and method for providing optimum resolution of T.V. cathode ray tube electron guns. 4,334,170, Cl. 315-16.000.
Rodder, Jerome A. Respirator valve. 4,333,453, Cl. 128-205.240.
Roelle, David, to Ben Pearson Archery Inc. Compound bow and bow cabling system. 4,333,443, Cl. 124-24.00R.
Rogan, John B.; and Morris, Robert V., to Standard Oil Company (Indiana). Polymerization catalysts. 4,334,047, Cl. 526-138.000.
Rohm and Haas Company: *See—*
Emmons, William D.; Winey, Donald A.; and Rounds, Nicholas A., 4,333,963, Cl. 427-44.000.
Rohner, Joachim, to W. Schlafhorst & Co. Device for preventing the discharge of dust and fiber particles from the work zones of a textile machine. 4,333,201, Cl. 15-301.000.
Rohr, Robert D.: *See—*
Schulte, Harold F.; Leliaert, Raymond M.; and Rohr, Robert D., 4,333,278, Cl. 51-434.000.
Rokach, Joshua: *See—*
Belanger, Patrice C.; Rokach, Joshua; Young, Robert N.; and Scheigetz, John, 4,334,077, Cl. 549-12.000.
Rolf C. Hagen (USA) Corp.: *See—*
Holbrook, Arthur J., 4,333,626, Cl. 248-360.000.
Rollei of America, Inc.: *See—*
Adams, James R., Jr.; and Ogawa, Francis T., 4,333,718, Cl. 354-31.000.
Roller, Hanno; Ohnmacht, Helmut; Lieber, Ludwig; and Nauerth, Karl-Heinz, to Fritz Eichenauer, Firma. Combined electric water heating and vessel support plate for a beverage preparation device. 4,334,141, Cl. 219-283.000.

Romero, Eduardo: *See*—
Rotolico, Anthony J.; and Romero, Eduardo, 4,333,416, Cl. 118-47.000.

Romey, Ingo: *See*—
Kolling, Georg; Romey, Ingo; and Kokot, Hellmut, 4,333,816, Cl. 208-91.000.

Rooke, William I.: *See*—
Ittner, Nelson C.; and Rooke, William I., 4,333,598, Cl. 228-181.000.

Rosellini, Bruno: *See*—
Keefe, Tom; and Rosellini, Bruno, 4,333,690, Cl. 308-3.800.

Rosenblad Corporation: *See*—
Henricson, Kaj O., 4,333,800, Cl. 203-87.000.

Rosenhagen, William; and Whalen, George J., to Ideal Toy Corporation. Multi-vehicle multi-controller radio remote control system. 4,334,221, Cl. 340-825.720.

Rosquist, Von D. Engine brake. 4,333,430, Cl. 123-321.000.

Rotolico, Anthony J.; and Romero, Eduardo, to Eutectic Corporation. Extension nozzle attachment for a flame-spray torch. 4,333,416, Cl. 118-47.000.

Rouanet, Alain: *See*—
Moisset, Jacques; Bonet, Claude; Rouanet, Alain; Petit, Alain; and Delmas, Robert, 4,333,766, Cl. 106-100.000.

Roucau, Gilles; and Roussy, Emilien. Electric knife sharpener. 4,333,273, Cl. 51-102.000.

Rounds, Nicholas A.: *See*—
Emmons, William D.; Winey, Donald A.; and Rounds, Nicholas A., 4,333,963, Cl. 427-44.000.

Roussel Uclaf: *See*—
Barnes, Alan C.; and Rowlands, David A., 4,333,934, Cl. 424-250.000.
Guillaume, Jacques; Nedelec, Lucien; and Dumont, Claude, 4,333,939, Cl. 424-263.000.

Roussy, Emilien: *See*—
Roucau, Gilles; and Roussy, Emilien, 4,333,273, Cl. 51-102.000.

Rowlands, David A.: *See*—
Barnes, Alan C.; and Rowlands, David A., 4,333,934, Cl. 424-250.000.

Roy, Siegfried S., to Pepsico, Inc. Floating manifold for multi-cavity injection mold. 4,333,629, Cl. 249-119.000.

Rozsavolgyi, Karoly: *See*—
Plosz, Sandor; Babos, Katalin; Rozsavolgyi, Karoly; and Felfoldy, Lajos, 4,333,837, Cl. 210-602.000.

Rubichi, Gianfranco: *See*—
Govoni, Gabriele; Rubichi, Gianfranco; and Guardigli, Pierluigi, 4,334,057, Cl. 528-500.000.

Rudell, Elliot A.; Cernansky, Joseph S.; and Kamrath, Richard P., to Rudell, Elliot A. Mountain climber game with moveably attached pieces. 4,333,655, Cl. 273-241.000.

Rudolph, Hans: *See*—
Schreckenberg, Manfred; Freitag, Dieter; Burgdorfer, Hans-Heribert; Lehnert, Gunther; Adelmann, Siegfried; and Rudolph, Hans, 4,333,809, Cl. 204-159.140.

Rudszinat, Willy: *See*—
Heitmann, Uwe; and Rudszinat, Willy, 4,333,335, Cl. 73-41.000.

Ruettiger, Wilhelm; Suetsch, Franz; and Wuerz, Albrecht, to BASF Aktiengesellschaft. Process for extracting water from desizing liquors. 4,333,190, Cl. 8-151.000.

Rupert, Steven L.: *See*—
Bukamier, Gary L.; and Rupert, Steven L., 4,333,812, Cl. 204-195.00G.

Rupp, Edward J., II: *See*—
Boney, Joel F.; Rupp, Edward J., II; and Thomas, James S., 4,334,268, Cl. 364-200.000.

Rupprecht, Hans S.: *See*—
Horng, Cheng T.; Poponiak, Michael R.; Rupprecht, Hans S.; and Schwenker, Robert O., 4,333,227, Cl. 29-580.000.

Russell, Robert J., to Mail-Ex Corporation. Envelope processing machine and method. 4,333,300, Cl. 53-569.000.

Russell, William M., to Facemate Corporation. Multi-ply fabric structure including interliner. 4,333,980, Cl. 428-192.000.

Rusznak, Istvan: *See*—
Toke, Laszlo; Szabo, Gabor T.; Szabo, Gabor; Nagy, Lajos; and Rusznak, Istvan, 4,334,103, Cl. 568-631.000.

Ryan, James A.: *See*—
Bourgeois, David R.; Ryan, James A.; and Varshney, Subhash C., 4,334,307, Cl. 371-16.000.

Ryan, John W., to Agrowplow Pty. Limited. Plow shank and digging blade attached to lower extremity thereof by adaptor. 4,333,536, Cl. 172-721.000.

Sack, Ernst T., to Sack GmbH. Method and plant for slitting a hot slab emerging from a continuous casting plant. 4,333,370, Cl. 83-56.000.

Sack GmbH: *See*—
Sack, Ernst T., 4,333,370, Cl. 83-56.000.

Saeki, Toshio: *See*—
Koizumi, Hajime; Toyama, Kozo; Kobayashi, Mikio; Hatano, Hajime; Saeki, Toshio; Mizukoshi, Kaoru; Tamanaga, Shinichi; Miyakawa, Keizo; and Kato, Tomoyasu, 4,333,285, Cl. 52-252.000.

Safdy, Max E.: *See*—
Kurchacova, Elva; and Safdy, Max E., 4,333,943, Cl. 424-269.000.

Saffire, Victor. Javelin. 4,333,643, Cl. 272-106.000.

Saito, Kohji; and Shibata, Hidenori, to Asahi Glass Company, Ltd. Method of preventing deterioration of palladium oxide anode. 4,333,804, Cl. 204-98.000.

Sakamae, Waichi: *See*—
Shibasaki, Yoshihisa; Sakamura, Ken; Sakamae, Waichi; Nakano, Koichi; and Aiso, Hideo, 4,334,269, Cl. 364-200.000.

Sakamoto, Shinichi: *See*—
Sasayama, Takao; and Sakamoto, Shinichi, 4,334,186, Cl. 323-365.000.

Sakamura, Ken: *See*—
Shibasaki, Yoshihisa; Sakamura, Ken; Sakamae, Waichi; Nakano, Koichi; and Aiso, Hideo, 4,334,269, Cl. 364-200.000.

Sakane, Toshio; Hosoe, Kazuya; Tsunekawa, Tokuichi; Kinoshita, Takao; and Kawabata, Takashi, to Canon Kabushiki Kaisha. Focus detection system. 4,333,716, Cl. 354-25.000.

Sakuma, Tokihiko: *See*—
Karino, Kimiji; Osawa, Tadao; Nagano, Masami; Sakuma, Tokihiko; Kanazawa, Yuiti; Kuroha, Tunemitu; and Tachibana, Kanji, 4,333,890, Cl. 261-41.00D.

Sakurai, Yoshifumi, to Olympus Optical Co., Ltd. Magnetic garnet film and manufacturing method therefor. 4,333,991, Cl. 428-702.000.

Sakuranaka, Toru: *See*—
Kobayashi, Masayoshi; Sakuranaka, Toru; and Nakagawa, Sachio, 4,333,432, Cl. 123-366.000.

Sam Stein Associates, Inc.: *See*—
Miller, Michael E.; and Hummel, Richard J., 4,333,415, Cl. 118-16.000.

Sampathkumar, Prathivadibhayankaram S.; and Dwivedi, Basant K., to Chimicasa GmbH. Method of producing α-L-aspartyl-L-phenylalanine methylester. 4,333,872, Cl. 260-112.50R.

Samuels, Samuel. Protective shoe. 4,333,248, Cl. 36-72.00R.

Sander, Ulrich: *See*—
Dorr, Karl H.; Diekmann, Helmut; Grimm, Hugo; Sander, Ulrich; Tacke, Michael; and Weber, Waldemar, 4,333,917, Cl. 423-522.000.

Sandland, Paul, to General Electric Company. Tomographic scanning apparatus. 4,334,154, Cl. 250-445.00T.

Sandmore, Donald K.: *See*—
Meal, John R.; and Sandmore, Donald K., 4,333,213, Cl. 29-25.420.

Sandoz Ltd.: *See*—
Ringwald, Erwin, 4,333,945, Cl. 424-270.000.

Sanford, Karl J.; and Eikenberry, Jon N., to Eastman Kodak Company. Continuous release of reagent in an analytical element to reduce assay interference. 4,333,733, Cl. 23-230.00B.

Sanka, Tsugio: *See*—
Iiyama, Masahiko; Sanka, Tsugio; and Naito, Kenji, 4,333,429, Cl. 123-274.000.

Sanyo Electric Co., Ltd.: *See*—
Nakamura, Kenzi, 4,334,206, Cl. 336-96.000.
Yamano, Masaru; and Kuwano, Yukinori, 4,334,120, Cl. 136-248.000.

Saran, Amitabh, to Xerox Corporation. Data decompressor circuit. 4,334,246, Cl. 358-261.000.

Sarcia, Domenico S., to Oerlikon-Buhrle U.S.A. Inc. Cryogenic apparatus. 4,333,755, Cl. 62-6.000.

Sasaki, Takao: *See*—
Imazeki, Ryoji; Yamazaki, Etsuo; and Sasaki, Takao, 4,334,281, Cl. 364-723.000.

Sasayama, Takao; and Sakamoto, Shinichi, to Hitachi, Ltd. Apparatus for driving hot-wire type flow sensor. 4,334,186, Cl. 323-365.000.

Sassella, Christopher D.: *See*—
Ikin, David D.; Butler, Paul G.; Sassella, Christopher D.; and Oliver, James K., 4,333,525, Cl. 165-104.210.

Satake, Tosimi: *See*—
Yamato, Noboru; and Satake, Tosimi, 4,333,990, Cl. 428-531.000.

Sato, Hideo: *See*—
Horie, Seiji; and Sato, Hideo, 4,334,001, Cl. 430-83.000.

Sato, Masaaki, to Olympus Optical Company Limited. Tape recorder having cassette reversing device. 4,334,251, Cl. 360-96.600.

Sato, Tetsuya. Operation supervisory apparatus of canned motor. 4,334,189, Cl. 324-158.0MG.

Satou, Shun; and Jitsumatsu, Yuuji, to Yagi Antenna Co., Ltd. Warning apparatus using microwaves. 4,334,214, Cl. 340-552.000.

Sattler, Joseph P.: *See*—
Morrison, Clyde A.; and Sattler, Joseph P., 4,333,344, Cl. 73-584.000.

Sauer, Gerhard: *See*—
Neef, Gunter; Eder, Ulrich; Haffer, Gregor; Sauer, Gerhard; Wiechert, Rudolf; and Steinbeck, Hermann, 4,333,928, Cl. 424-243.000.

Sauntson, Barry J., to Scott Bader Company Limited. Ceramic tile adhesives. 4,333,867, Cl. 524-547.000.

Sawada, Hidekazu: *See*—
Suzuki, Takashi; Sawada, Hidekazu; and Asai, Tsunetomo, 4,334,022, Cl. 435-119.000.

Sawyer, George N., to General Electric Company. Superheat controller. 4,333,317, Cl. 62-212.000.

Scafidi, Christopher J.: *See*—
O'Neill, Joseph L.; and Scafidi, Christopher J., 4,333,696, Cl. 339-17.0LM.

Scagnelli, George J.: *See*—
Orr, David A.; Gala, Hiren S.; and Scagnelli, George J., 4,333,232, Cl. 29-767.000.

Scarfone Construction Limited: *See*—
Scarfone, Santo, 4,333,281, Cl. 52-169.500.

Scarfone, Santo, to Scarfone Construction Limited. Basement wall draining molding. 4,333,281, Cl. 52-169.500.

Schade, Otto H., Jr., to RCA Corporation. Amplifier using lateral and vertical transistors. 4,334,196, Cl. 330-253.000.

Schaefer, Hans-Joachim. Convertible sports device. 4,333,249, Cl. 36-115.000.

Schaefer, Hartmann: *See—*
Eistetter, Klaus; Kley, Hans-Peter; Menge, Heinz-Gunter; and Schaefer, Hartmann, 4,333,942, Cl. 424-267.000.

Schaefer, William J. Arm control device for athlete. 4,333,647, Cl. 273-54.00B.

Schaffron, Helmut T. Rotary bag sealing and perforating machine. 4,333,790, Cl. 156-510.000.

Scharwaechter, Peter; Gutsche, Klaus; Kohlmann, Wilhelm; Kroemer, Gerhard, deceased; by Kroemer, Norma, legal representative; by Kroemer, Helmut, legal representative; and by Kroemer, Maria M., legal representative, to BASF Aktiengesellschaft. Novel amidinobenzylpyrimidines, processes for their manufacture and antibacterial and antiprotozoal use thereof. 4,333,936, Cl. 424-251.000.

Schawohl, Georg: *See—*
Gauhl, Helmgard; Schawohl, Georg; Seidel, Hans; and Beaucamp, Klaus, 4,334,023, Cl. 435-190.000.

Scheifele, Clifford A., Jr., to UOP Inc. Separation and recovery of hydrogen and normally gaseous hydrocarbons from net excess hydrogen from a catalytic reforming process. 4,333,819, Cl. 208-101.000.

Scheifele, Clifford A., Jr., to UOP Inc. Recovery of normally gaseous hydrocarbons from net excess hydrogen in a catalytic reforming process. 4,333,820, Cl. 208-101.000.

Scheigetz, John: *See—*
Belanger, Patrice C.; Rokach, Joshua; Young, Robert N.; and Scheigetz, John, 4,334,077, Cl. 549-12.000.

Scheiterer, Eduard: *See—*
Thinschmidt, Hans; and Scheiterer, Eduard, 4,334,308, Cl. 371-29.000.

Scheler, Siegfried, to Hoechst Aktiengesellschaft. Light-sensitive diazotype material with 2-hydroxy-3-naphthoic acid amides having 6-sulfonic acid amide substitution. 4,334,004, Cl. 430-176.000.

Schering, Aktiengesellschaft: *See—*
Neef, Gunter; Eder, Ulrich; Haffer, Gregor; Sauer, Gerhard; Wiechert, Rudolf; and Steinbeck, Hermann, 4,333,928, Cl. 424-243.000.

Schick, Henry, to Gilbert Mfg., Co., Inc. In line cartridge type fuse holder. 4,333,701, Cl. 339-97.00P.

Schindler, Heinrich: *See—*
Gebel, Rudolf; Peche, Gerhard; Schindler, Heinrich; and Welly, Jurgen-Dietrich, 4,334,133, Cl. 200-279.000.

Schindlmayr, Peter; and Zapfel, Horst, to Arenco-BMD Maschinenfabrik GmbH. Method and apparatus for the manufacture of tanned hides and skins. 4,333,731, Cl. 8-436.000.

Schlegel, Hans J. Elevator head material guide means. 4,333,561, Cl. 198-703.000.

Schleyer, Herbert; and Bieber, Theo, to Fag Kugelfischer Georg Schafer & Co. False-twist system switchable between S-twist and Z-twist. 4,333,308, Cl. 57-339.000.

Schluckbier, Gary W., to DEC International, Inc. Milking unit support and detacher mechanism. 4,333,421, Cl. 119-14.080.

Schlumberger Technology Corporation: *See—*
Clavier, Christian M., 4,334,271, Cl. 364-422.000.

Schmelter, Ernst A.; and Simmert, Bruno W. Wall-type intercom station for detention and penitentiary facilities. 4,334,260, Cl. 361-360.000.

Schmid, Rolf: *See—*
Preuss, Wolfgang; Bahn, Michael; Schmid, Rolf; and Wagner, Rudiger, 4,333,880, Cl. 260-397.100.

Schmid, Wolfgang, to Ciba-Geigy Corporation. Method of combatting harmful microorganisms using quinoxaline compounds. 4,333,931, Cl. 424-248.540.

Schmidt, Andreas; Kirchmayr, Rudolf; and Randell, Donald R., to Ciba-Geigy Corporation. Dithiophosphate lubricant additives. 4,333,841, Cl. 252-32.70E.

Schmidt, Andreas; and Schwarzenbach, Kurt, to Ciba-Geigy Corporation. Phosphite ester stabilizers. 4,333,868, Cl. 524-152.000.

Schmidt, Erwin, to Hoechst Aktiengesellschaft. Process for the preparation of N-α-alkoxyalkyl-carboxamides, and some representatives of this class of compounds and secondary products obtained therefrom. 4,334,097, Cl. 564-201.000.

Schmidtchen, Hans-Martin, to Kabel und Metallwerke Gutehoffnungshutte A.G. Method of making a foamed plastic. 4,333,898, Cl. 264-45.900.

Schmit, Georges J. E.; and Welter, Thomas N. H., to Goodyear Tire & Rubber Company, The. Tire with composite reinforcement cord. 4,333,507, Cl. 152-359.000.

Schmitt, Frederick L.: *See—*
Mookherjee, Braja D.; Trenkle, Robert W.; Wilson, Richard A.; Schmitt, Frederick L.; Vock, Manfred H.; Granda, Edward J.; Vinals, Joaquin; Kiwala, Jacob; and Schreiber, William L., 4,334,098, Cl. 568-347.000.

Schmitz, Klaus: *See—*
Kubbeler, Hans-Klaus; Erpenbach, Heinz; Gehrmann, Klaus; and Schmitz, Klaus, 4,333,884, Cl. 260-546.000.

Schneider, Manfred; and Schubert, Frank, to Veb Wirkmaschinenbau Karl-Marx-Stadt. Knitware structure. 4,333,321, Cl. 66-192.000.

Schneider, Manfred: *See—*
Deubel, Reinhold; Opitz, Konrad; Kruse, Hubert; Schneider, Manfred; and Uhrig, Heinz, 4,333,732, Cl. 8-527.000.

Schneider, Thomas E.: *See—*
Funcik, Jack F.; Bennet, Joseph C.; Tubbs, Joseph T.; and Schneider, Thomas E., 4,333,230, Cl. 29-749.000.

Schoettle, Klaus; and Gliniorz, Lothar, to BASF Aktiengesellschaft. Recording medium and leader assembly. 4,333,619, Cl. 242-195.000.

Schoettle, Klaus: *See—*
Nagel, Peter; Schoettle, Klaus; Wittkamp, Reinrich; and Hauck, Karl, 4,333,418, Cl. 118-106.000.

Schott, Werner: *See—*
Baltensperger, Heinz; Buhler, Karl; and Schott, Werner, 4,334,119, Cl. 373-159.000.

Schrader, Jimmy, to Mathis, John S., a part interest. Synthetic fire log and method for making same. 4,333,738, Cl. 44-15.00B.

Schreck, Raymond M.; Brown, Bill G.; and Gilda, David A., to General Electric Company. Ice dispenser assembly. 4,333,588, Cl. 222-164.000.

Schreckenberg, Manfred; Freitag, Dieter; Burgdorfer, Hans-Heribert; Lehnert, Gunther; Adelmann, Siegfried; and Rudolph, Hans, to Bayer Aktiengesellschaft. Cross-linkable polycarbonate elastomers, a process for their preparation and use for packaging medicines. 4,333,809, Cl. 204-159.140.

Schreiber-Klaranlagen Dr.-Ing. Aug. Schreiber GmbH & Co. KG: *See—*
Ballnus, Wilhelm, 4,333,838, Cl. 210-614.000.

Schreiber, William L.: *See—*
Mookherjee, Braja D.; Trenkle, Robert W.; Wilson, Richard A.; Schmitt, Frederick L.; Vock, Manfred H.; Granda, Edward J.; Vinals, Joaquin; Kiwala, Jacob; and Schreiber, William L., 4,334,098, Cl. 568-347.000.

Schroeder, Dale W., to Westinghouse Electric Corp. Motor brake. 4,334,181, Cl. 318-762.000.

Schroeder, Hartmut R.: *See—*
Buckler, Robert T.; and Schroeder, Hartmut R., 4,334,069, Cl. 544-237.000.

Schubert, Frank: *See—*
Schneider, Manfred; and Schubert, Frank, 4,333,321, Cl. 66-192.000.

Schuler, Bob A. Shower curtain. 4,333,187, Cl. 4-608.000.

Schulte, Harold F.; Leliaert, Raymond M.; and Rohr, Robert D., to Wheelabrator-Frye Inc. Bladed centrifugal blasting wheel. 4,333,278, Cl. 51-434.000.

Schulte, Heinrich: *See—*
Hoffmann, Kurt; and Schulte, Heinrich, 4,334,236, Cl. 357-59.000.

Schulz, Johann G. D., to Gulf Research & Development Company. Organic acids and process for preparing same. 4,334,084, Cl. 562-410.000.

Schulze, Rolf: *See—*
Muller, Heinz; Jauchen, Peter; Szonn, Bodo; and Schulze, Rolf, 4,333,449, Cl. 128-155.000.

Schumann, Klaus: *See—*
Altenschopfer, Theodor; Schumann, Klaus; and Grodau, Dieter, 4,333,771, Cl. 134-7.000.

Schuster, Friedrich; and Hermanns, Hans, to Kugelfischer Georg Schafer & Co. Friction rotor. 4,333,307, Cl. 57-334.000.

Schwarzenbach, Kurt: *See—*
Schmidt, Andreas; and Schwarzenbach, Kurt, 4,333,868, Cl. 524-152.000.

Schwenker, Robert O.: *See—*
Horng, Cheng T.; Poponiak, Michael R.; Rupprecht, Hans S.; and Schwenker, Robert O., 4,333,227, Cl. 29-580.000.

Sciaraffa, Michael A.; Thome, David G.; and Vogt, Clifford M., to Kimberly-Clark Corporation. Soft, bulky, lightweight nonwoven web and method of producing; the web has both fused spot bonds and patterned embossments. 4,333,979, Cl. 428-179.000.

Scott Bader Company Limited: *See—*
Sauntson, Barry J., 4,333,867, Cl. 524-547.000.

Scott, William L.: *See—*
Di Martini, Carl R.; Scott, William L.; and Bulvanoski, Leo J., 4,333,762, Cl. 75-69.000.
Di Martini, Carl R.; Howe, Herbert E.; Scott, William L.; and Bulvanoski, Leo J., 4,333,763, Cl. 75-77.000.

Sealectro Corporation: *See—*
Dreyer, Charles W., 4,333,697, Cl. 339-31.00R.

Seaman, William E., to Newell Research Corporation. Apparatus for reducing tape tension variations in a peripheral belt drive tape transport system. 4,333,618, Cl. 242-192.000.

Searcy, Eugene S., to Rockwell International Corporation. Inspection device for measuring the contour and/or angular tolerance of a part. 4,333,240, Cl. 33-174.00G.

Sears, Roebuck and Co.: *See—*
Gall, John C., 4,333,584, Cl. 220-309.000.

Sedlak, John M.: *See—*
Davidson, Craig R.; and Sedlak, John M., 4,333,805, Cl. 204-98.000.

Seeger, Walter, to Max Roth KG. Muffler for combustion engines. 4,333,544, Cl. 181-266.000.

Seeman, Jeffrey L.; and Dionian, James A. Explosion prevention control system for a fuel-gas burning automatic ignition appliance and associated gas distribution system. 4,334,258, Cl. 361-170.000.

Seeman, Thomas A. Method for producing a pressed glass article. 4,333,756, Cl. 65-25.100.

Seger, Edward J.; and Haupin, Warren E., to Aluminum Company of America. Method and apparatus for controlling the heat balance in aluminum reduction cells. 4,333,803, Cl. 204-67.000.

Seibt, Judith. Button anchor method and apparatus. 4,333,182, Cl. 2-265.000.

Seidel, Hans: *See—*
Gauhl, Helmgard; Schawohl, Georg; Seidel, Hans; and Beaucamp, Klaus, 4,334,023, Cl. 435-190.000.

Seilly, Alec H., to Lucas Industries Limited. Electromagnetic devices. 4,334,205, Cl. 335-220.000.

Seitz, Clyde R., to Bertea Corporation. Anti-jam hydraulic servo valve. 4,333,387, Cl. 91-1.000.

Sekigawa, Keiji: *See—*
Okajima, Yakutaro; and Sekigawa, Keiji, 4,333,957, Cl. 426-140.000.

Sell, Irving W.: *See—*
Sell, Roger I.; and Sell, Irving W., 4,333,444, Cl. 126-417.000.

Sell, Roger I.; and Sell, Irving W., to Sell, Roger I. Solar powered ice melter for roofs. 4,333,444, Cl. 126-417.000.

Semiconductor Research Foundation: *See—*
Nishizawa, Jun-Ichi; and Kimura, Kitsuhiro, 4,333,989, Cl. 428-446.000.

Seno, Eugene T.: *See—*
Baltz, Richard H.; Wild, Gene M.; and Seno, Eugene T., 4,334,019, Cl. 435-76.000.

Seoka, Yoshio: *See—*
Aoki, Kozo; Seoka, Yoshio; and Yokota, Yukio, 4,334,011, Cl. 430-552.000.

Servel, Michel J. Time division multiplex switching network with an associative buffer store of the register counter type. 4,334,304, Cl. 370-66.000.

Sestokas, Elena: *See—*
Buhs, Rudolf P.; Jacob, Theodore A.; Miwa, Gerald; Sestokas, Elena; Taub, Rae; and Walsh, John S., 4,333,925, Cl. 424-181.000.

Shachar, Sraya, to Solmat Systems Ltd. Method of utilizing solar ponds for effecting controlled temperature changes of solutions particularly in processes involving the dissolution and/or precipitation of salts. 4,333,736, Cl. 23-295.00S.

Shafrir, Doron; and Lamb, Jeffrey. Controller for air conditioning units, heating units and the like. 4,333,519, Cl. 165-12.000.

Shahin, Majdi M.: *See—*
Bugaut, Andree; Shahin, Majdi M.; Vandenbossche, Jean-Jacques H.; and Kalopissis, Gregoire, 4,333,730, Cl. 8-407.000.

Shakespeare, Charles B.: *See—*
Moreno, John R.; Byrne, Richard J.; and Shakespeare, Charles B., 4,333,475, Cl. 128-711.000.

Sharp Kabushiki Kaisha: *See—*
Asada, Atsushi, 4,334,298, Cl. 368-63.000.
Miyakoshi, Kazumitsu; and Maekawa, Koji, 4,334,279, Cl. 364-710.000.

Shatz, Kenneth J.: *See—*
Cardone, Joseph T.; Shatz, Kenneth J.; and Dill, James M., 4,333,313, Cl. 60-649.000.

Shaw, Arthur. Sandless concrete. 4,333,765, Cl. 106-98.000.

Shaw, Fred M.: *See—*
Parman, Dan F.; Wiebush, LeMoey M.; Shaw, Fred M.; and Cummins, James P., 4,334,171, Cl. 315-199.000.

Shaw, Kenneth L.: *See—*
Cooper, Steven R.; and Shaw, Kenneth L., 4,334,131, Cl. 200-82.00R.

Shefrin, Joseph, to Boeing Company, The. Load limiter. 4,333,551, Cl. 188-372.000.

Shell Oil Company: *See—*
Richardson, Edwin A., 4,333,764, Cl. 106-87.000.

Shelton, Robert B. Chiropractic table with paper retainer. 4,333,637, Cl. 269-322.000.

Shepherd Products U.S. Inc.: *See—*
Atwood, John T., 4,333,207, Cl. 16-35.00R.

Shepherd, Robert G., to American Cyanamid Company. Ring-fluorinated 4-(monosubstituted-amino) phenyl compounds in inhibiting atherosclerotic lesion development. 4,333,940, Cl. 424-263.000.

Sherlock, William H.: *See—*
Still, Thomas W.; and Sherlock, William H., 4,333,441, Cl. 123-590.000.

Sherwood Medical Industries Inc.: *See—*
Bodicky, Raymond O., 4,333,455, Cl. 128-214.400.
Hertl, William; and Zine, Anthony R., Jr., 4,333,564, Cl. 206-216.000.

Shibasaki, Yoshihisa; Sakamura, Ken; Sakamae, Waichi; Nakano, Koichi; and Aiso, Hideo, to Panafacom Limited; and High Level Machines Corp. Data processing system having an integrated stack and register machine architecture. 4,334,269, Cl. 364-200.000.

Shibata, Hidenori: *See—*
Saito, Kohji; and Shibata, Hidenori, 4,333,804, Cl. 204-98.000.

Shibata, Yoshihisa: *See—*
Matsumura, Shingo; Enomoto, Hiroshi; Aoyagi, Yoshiaki; and Shibata, Yoshihisa, 4,333,933, Cl. 424-249.000.

Shima, Yoshihiro: *See—*
Kashioka, Seiji; Shima, Yoshihiro; and Miyatake, Takafumi, 4,334,241, Cl. 358-107.000.

Shimada, Kunihiko; and Tsuchiya, Yukio, to Pioneer Electronic Corporation. Magnetic circuit for planar diaphragm type loudspeaker. 4,334,127, Cl. 179-115.50R.

Shimada, Shuya: *See—*
Shimizu, Yasuo; Takao, Hisashi; Asano, Shoji; Shimada, Shuya; and Kikkawa, Kazutoshi, 4,334,066, Cl. 544-149.000.

Shimada, Yukio; Suzuki, Naoyoshi; Ohashi, Toshio; and Inoshita, Yasushi, to Nissan Motor Company, Limited. Air intake control system in air conditioning system. 4,333,606, Cl. 237-12.30A.

Shimajiri, Tokiji: *See—*
Inaba, Seiuemon; Shimajiri, Tokiji; and Toyoda, Kenichi, 4,333,363, Cl. 74-826.000.

Shimizu, Noriyuki: *See—*
Murata, Susumu; Shimizu, Noriyuki; and Kokeguchi, Sadao, 4,333,955, Cl. 426-44.000.

Shimizu, Yasuo; Takao, Hisashi; Asano, Shoji; Shimada, Shuya; and Kikkawa, Kazutoshi, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Heterocyclic containing 5-oxo pyrans. 4,334,066, Cl. 544-149.000.

Shinko Electric Co., Ltd.: *See—*
Nonaka, Takeyoshi; and Otsuka, Kazuo, 4,333,558, Cl. 198-391.000.

Shinozaki, Fumiaki: *See—*
Kitajima, Masao; Tachikawa, Hiromichi; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,334,006, Cl. 430-254.000.

Shinto Paint Co., Ltd.: *See—*
Suzuki, Tameyuki; and Kubo, Akira, 4,333,807, Cl. 204-181.00T.

Shiplee, Lewis D., III. Disposable needle assembly. 4,333,479, Cl. 128-766.000.

Shirahata, Ryuji; Yanai, Akio; and Kitamoto, Tatsuji, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,333,985, Cl. 428-336.000.

Shirai, Kenji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Brake shoe and support structure for a disc brake. 4,333,550, Cl. 188-72.200.

Shirato, Yoshiaki; Takatori, Yasushi; Hara, Toshitami; Nishimura, Yukuo; and Takahashi, Michiko, to Canon Kabushiki Kaisha. Liquid droplet forming apparatus. 4,334,234, Cl. 346-140.00R.

Shishido, Tadao: *See—*
Mifune, Hiroyuki; Ishiguro, Shoji; Shishido, Tadao; Fuseya, Yoshiharu; and Tsujikawa, Teruaki, 4,334,010, Cl. 430-551.000.
Mifune, Hiroyuki; Shishido, Tadao; Ishiguro, Shoji; and Ueyanagi, Jisaburo, 4,334,014, Cl. 430-611.000.

Shishido, Toetsu: *See—*
Yajima, Seishi; Okamura, Kiyohito; and Shishido, Toetsu, 4,334,051, Cl. 528-25.000.

Shope, Thomas, to CP Test Services - Valvco, Inc. Valve box. 4,333,494, Cl. 137-364.000.

Shores, David H., to Tektronix, Inc. YIG Bandpass filter interconnected by means of longitudinally split coaxial transmission lines. 4,334,201, Cl. 333-202.000.

Short, James E., Jr.: *See—*
Montgomery, Francis E.; Short, James E., Jr.; and Weaver, William J., 4,333,737, Cl. 23-297.000.

Shuman, Robert T., to Eli Lilly and Company. Pharmacologically active peptides. 4,333,873, Cl. 260-112.50E.

Siecor Corporation: *See—*
Davis, Lawrence E.; and Patel, Naren I., 4,333,706, Cl. 350-96.230.

Siemens Aktiengesellschaft: *See—*
Bredow, Reinhard, 4,334,225, Cl. 343-100.0LE.
Gebel, Rudolf; Peche, Gerhard; Schindler, Heinrich; and Welly, Jurgen-Dietrich, 4,334,133, Cl. 200-279.000.
Hauenstein, Alfred, 4,334,183, Cl. 323-235.000.
Hauenstein, Alfred, 4,334,184, Cl. 323-235.000.
Herbst, Heiner; Pfleiderer, Hans-Joerg; and Grassl, Hans-Peter, 4,334,150, Cl. 250-201.000.
Herbst, Heiner; Pfleiderer, Hans-Joerg; and Grassl, Hans-Peter, 4,334,151, Cl. 250-201.000.
Herbst, Heiner; and Niemeyer, Matthias, 4,334,239, Cl. 358-44.000.
Hoffmann, Kurt; and Schulte, Heinrich, 4,334,236, Cl. 357-59.000.
Thinschmidt, Hans; and Scheiterer, Eduard, 4,334,308, Cl. 371-29.000.

Simmert, Bruno W.: *See—*
Schmelter, Ernst A.; and Simmert, Bruno W., 4,334,260, Cl. 361-360.000.

Simmons, Catherine J.: *See—*
Tran, Danh C.; Macedo, Pedro B.; Simmons, Joseph H.; Simmons, Catherine J.; and Lagakos, Nicholas, 4,333,847, Cl. 252-629.000.

Simmons, John P., to Borg-Warner Corporation. Transmission shift control apparatus. 4,333,360, Cl. 74-473.00P.

Simmons, Joseph H.: *See—*
Tran, Danh C.; Macedo, Pedro B.; Simmons, Joseph H.; Simmons, Catherine J.; and Lagakos, Nicholas, 4,333,847, Cl. 252-629.000.

Simpson, Barbara E.: *See—*
Kleber, John W.; and Simpson, Barbara E., 4,333,919, Cl. 424-15.000.

Simpson, George R.: *See—*
Green, Frederick A.; Simpson, George R.; Avery, Stephen T.; and Durbin, John A., 4,333,723, Cl. 355-71.000.

Sims, Anson: *See—*
Jones, Lawrence T.; Sims, Anson; Howden, Ashley G.; Knighton, Mark S.; Kingsbury, L. C. James; and Conroy, Richard F. M., 4,333,261, Cl. 46-257.000.

Singer Company, The: *See—*
Lerner, David A., 4,333,411, Cl. 112-278.000.
Yatsushiro, Kenji; and Kuchuris, George F., 4,334,164, Cl. 310-114.000.

Sink, William H.; and Lane, Wendell, to Dana Corporation. Self-aligning clutch plate drive apparatus. 4,333,554, Cl. 192-70.190.

Siwecki, Thomas L.; and Andeen, Gerry B., to Siwecki, Thomas L. Rotating solution separation system. 4,333,832, Cl. 210-195.200.

Sjobom, Axel H. Axle bearing. 4,333,693, Cl. 308-176.000.

Skiba, Frank G.: *See—*
Neumann, Harry C.; and Skiba, Frank G., 4,333,214, Cl. 29-80.000.

Skinner, Richard E.: *See—*
Mahan, Douglas P.; Skinner, Richard E.; and McClanathan, Robert A., 4,334,136, Cl. 219-10.55B.

Sky-Top Sunroofs Ltd.: *See—*
Wolf, Ernest; and Amos, John, 4,333,680, Cl. 296-216.000.

Slaughter, Edward R., to United Technologies Corporation. Method for manufacturing a sandwich panel structure. 4,333,216, Cl. 29-157.00R.

Slingsby, Barry, to Stromberg-Carlson Corporation. Control circuit for concurrently monitoring and controlling functions and frequency

modulating status information in a digital data network. 4,334,126, Cl. 179-18.0ES.
Sloan-Kettering Institute for Cancer Research: *See—*
Fleisher, Martin, 4,333,734, Cl. 23-230.00B.
Slovenska vysoka skola technicka: *See—*
Tkac, Alexander; and Cvengros, Jan, 4,333,822, Cl. 208-184.000.
Smiesko, Frank A.: *See—*
Beiswenger, John L.; Moon, Howard R.; Chaphalkar, Dhananjay V.; and Smiesko, Frank A., 4,333,493, Cl. 137-268.000.
Smigerski, Hans-Jurgen: *See—*
Meyer, Klaus-Rudolf; Hornung, Karl-Heinz; Feldmann, Rainer; and Smigerski, Hans-Jurgen, 4,334,056, Cl. 528-496.000.
Smith, Dean C.; and Quinton, Gary F. Paper slitting device. 4,333,234, Cl. 30-2.000.
Smith, Donald H.: *See—*
Thomas, Ronald; and Smith, Donald H., 4,333,302, Cl. 56-10.500.
Smith, Henry I., to Massachusetts Institute of Technology. Enhancing epitaxy and preferred orientation. 4,333,792, Cl. 156-612.000.
Smith, James: *See—*
Kerigan, Shaun C.; Key, Brian D.; and Smith, James, 4,334,286, Cl. 364-900.000.
Smith, Julian M.: *See—*
Turner, Milton; and Smith, Julian M., 4,333,664, Cl. 280-261.000.
Smith Kline & French Laboratories Limited: *See—*
Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., 4,333,946, Cl. 424-273.00R.
Smith, Peter H., to General Electric Company. Utensil location sensor for induction surface units. 4,334,135, Cl. 219-10.49R.
Smith, Peter H.: *See—*
Stottman, Richard L.; and Smith, Peter H., 4,333,521, Cl. 165-63.000.
Smith, Rory J. M.; and McRitchie, Aalan C., to Procter & Gamble Company, The. Detergent compositions comprising mixture of cationic, anionic and nonionic surfactants. 4,333,862, Cl. 252-547.000.
Smith, Russell G., to Xomox Corporation. Lip seal. 4,333,632, Cl. 251-214.000.
Smithsonian Institution, The: *See—*
Adey, Walter H., 4,333,263, Cl. 47-1.400.
Smrt, Thomas J. Tree nursery clip. 4,333,264, Cl. 47-42.000.
Smyth Aerodynamics, Inc.: *See—*
Smyth, Jerry S., 4,333,446, Cl. 126-438.000.
Smyth, Jerry S., to Smyth Aerodynamics, Inc. Solar concentrator. 4,333,446, Cl. 126-438.000.
Snamprogetti S.p.A.: *See—*
Ginatta, Marco, 4,333,219, Cl. 29-403.300.
Greco, Alberto; and Bertolini, Guglielmo, 4,333,881, Cl. 260-429.00R.
Mantovani, Elvio; Palladino, Nicola; and Zanobi, Antonio, 4,334,101, Cl. 568-454.000.
Snijders, Wilfred A. M., to U.S. Philips Corporation. Echo canceler for homochronous data transmission systems. 4,334,128, Cl. 179-170.200.
Sochaczevski, Aviezer. Electronic speed measuring device particularly useful as a jogging computer. 4,334,190, Cl. 324-171.000.
Societe Anonyme Automobiles Citroen: *See—*
Perez, Jean; and Carnus, Jean-Claude, 4,333,438, Cl. 123-569.000.
Societe Anonyme de Telecommunications: *See—*
Bertin, Marcel R.; Boutmy, Patrick E.; Le Fort, Gilbert J.; and Walraet, Jean G., 4,334,303, Cl. 370-13.000.
Societe Anonyme dite: L'Oreal: *See—*
Bugaut, Andree; Shahin, Majdi M.; Vandenbossche, Jean-Jacques H.; and Kalopissis, Gregoire, 4,333,730, Cl. 8-407.000.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Bracco, Umberto; and Viret, Jean-Louis, 4,333,959, Cl. 426-614.000.
Societe d'Etudes, Recherches et Construction Electroniques Sercel: *See—*
Nard, Georges P.; Bourasseau, Daniel J. E.; and Rabian, Jean M., 4,334,314, Cl. 375-111.000.
Societe Nationale Industrielle Aerospatiale: *See—*
Boeglin, Paul H.; and Chigot, Claude R., 4,333,381, Cl. 89-1.00B.
Sogoh, Kiyoshi, to Nihon-Hammond Kabushiki Kaisha. Electronic musical instrument having time multiplexed keying system. 4,333,375, Cl. 84-1.010.
Solmat Systems Ltd.: *See—*
Shachar, Sraya, 4,333,736, Cl. 23-295.00S.
Sommer, Helmut: *See—*
Bergthaller, Peter; and Sommer, Helmut, 4,334,013, Cl. 430-569.000.
Sommer, Steven. Deck of playing cards. 4,333,656, Cl. 273-299.000.
Sony Corporation: *See—*
Yokoyama, Eiichi, 4,334,249, Cl. 360-30.000.
Soong, Tsai C. String load apportioned racket. 4,333,650, Cl. 273-73.00D.
Sorensen, Jens O., to Trade Finance International. Thermodynamic energy conversion system and method, utilizing a thermodynamic working fluid of encased expandites. 4,333,312, Cl. 60-641.700.
Southam, Barry, to Wahlco, Inc. Gas conditioning means for a plurality of boilers. 4,333,746, Cl. 55-106.000.
Southern California Gas Company: *See—*
Elkins, Robert H.; Durkin, Gary M.; and Macriss, Robert A., 4,333,524, Cl. 165-104.160.
Sova, Stanley G.: *See—*
Civardi, Frank P.; Sova, Stanley G.; and Getting, Milan J., 4,333,786, Cl. 156-306.600.
Speakman, John G.; and Wilkinson, Nicholas P., to BP Chemicals Limited; and University of Nottingham, The. Olefin polymerization catalyst, process and polyolefin product. 4,333,851, Cl. 252-429.00B.
Spease, Arthur L., to Teleflex Incorporated. Remote control (swivel joint). 4,333,361, Cl. 74-501.00P.
Speidel & Keller GmbH & Co. KG: *See—*
Bramm, Guenter; and Novak, Pavel, 4,334,180, Cl. 318-687.000.
Spencer, Gerald: *See—*
Strawson, Kenneth H.; and Spencer, Gerald, 4,333,895, Cl. 264-24.000.
Speranza, Donald: *See—*
Hoppie, Lyle O.; and Speranza, Donald, 4,333,553, Cl. 192-4.00A.
Sperry Corporation: *See—*
Greiner, James G.; Lehman, Joseph J.; and Priepke, Edward H., 4,333,304, Cl. 56-119.000.
Grimes, Terrence L.; and Swartz, Harold L., 4,334,179, Cl. 318-661.000.
Katagi, Kazuo, 4,334,223, Cl. 343-5.00W.
Kelley, Michael R.; Emfinger, Jack E.; and Dassele, Michael A., 4,334,222, Cl. 340-870.290.
Wong, Wilson T. C., 4,334,284, Cl. 364-748.000.
Sperry Rand Corporation: *See—*
Wiedenman, Gregory B.; and Marsh, Phillip W., 4,334,287, Cl. 364-900.000.
Spin Physics, Inc.: *See—*
Lemke, James U., 4,334,247, Cl. 360-10.000.
Spooner, Allan: *See—*
Chan, James K.; May, Curtis L.; and Spooner, Allan, 4,334,244, Cl. 358-166.000.
Spry, Douglas O., to Eli Lilly and Company. Cephalosporin vinyl halides. 4,334,063, Cl. 544-28.000.
Spry, Douglas O., to Eli Lilly and Company. Cephalosporin vinyl halides. 4,334,064, Cl. 544-30.000.
SPS Technologies, Inc.: *See—*
Aspers, Arthur J., 4,333,220, Cl. 29-407.000.
Srivastava, Gopal K., to Zenith Radio Corporation. Pulse width limiter. 4,334,243, Cl. 358-153.000.
SS Pharmaceutical Co., Ltd.: *See—*
Miyamura, Sadao, 4,334,025, Cl. 435-253.000.
Stainless Steel Sinks, Inc.: *See—*
Jensen, Harald W., deceased; and Jensen, Christen V., 4,333,188, Cl. 4-514.000.
Stamires, Dennis: *See—*
Lim, John; Brady, Michael; and Stamires, Dennis, 4,333,857, Cl. 252-455.00Z.
Stamp, Custis L., Jr.; and Herzog, Rollie R., to General Electric Company. Automatic control apparatus for a heat pump system. 4,333,316, Cl. 62-126.000.
Standard Oil Company, The: *See—*
Milberger, Ernest C.; Bremer, Noel J.; and Dria, Dennis E., 4,333,853, Cl. 252-435.000.
Velenyi, Louis J.; and Krupa, Andrew S., 4,334,116, Cl. 585-440.000.
Standard Oil Company (Indiana): *See—*
Basalay, Robert J.; and Udelhofen, John H., 4,334,085, Cl. 564-367.000.
Myerholtz, Carl A.; and Myerholtz, Ralph W., Jr., 4,333,336, Cl. 73-56.000.
Rogan, John B.; and Morris, Robert V., 4,334,047, Cl. 526-138.000.
Stansbury, LeRoy, Jr.; and Donovan, William F., to United States of America, Army. Primer device. 4,333,383, Cl. 89-7.000.
Steel Web Corporation: *See—*
Jackson, Edgar D., 4,333,293, Cl. 52-692.000.
Stefiuk, John. System and methods with scavenging capabilities for simultaneously filling and evacuating a plurality of separate pressure vessels. 4,333,503, Cl. 141-8.000.
Stehman, Harold E.; and Daniels, Herbert E., to General Electric Company. X-Ray tube grid bias supply. 4,334,153, Cl. 250-405.000.
Stein, Gunter: *See—*
Lohner, Ingolf; Barnert, Konrad; and Stein, Gunter, 4,333,437, Cl. 123-502.000.
Steinbeck, Hermann: *See—*
Neef, Gunter; Eder, Ulrich; Haffer, Gregor; Sauer, Gerhard; Wiechert, Rudolf; and Steinbeck, Hermann, 4,333,928, Cl. 424-243.000.
Steinberg, Hyman. Solar alignment device. 4,333,704, Cl. 350-96.100.
Stemen, Michael J., to Continental Group, Inc., The. Crimped-on drum cover handle. 4,333,599, Cl. 229-5.700.
Sterling Drug Inc.: *See—*
Margulies, Herman, 4,333,457, Cl. 128-218.00R.
Margulies, Herman; and Webb, William G., 4,333,458, Cl. 128-218.00R.
Webb, William G., 4,333,456, Cl. 128-218.00R.
Steuernagel, Hans H.; Hoyer, Ernst; and Meininger, Fritz, to Hoechst Aktiengesellschaft. Process for the preparation of sulfuric acid semiester ethylsulfonyl compounds of aminophenols, aminobenzanilides or phenylpyrazolones by esterification with sulfuric acid and/or sulfur trioxide in a kneader. 4,334,076, Cl. 548-375.000.
Stevenson, Charles F., to Rinn Corporation. Multipurpose dental X-ray film mount arrangement. 4,333,254, Cl. 40-158.00B.
Steward, David L.: *See—*
Baratz, Brenda S.; Phillips, Robert A.; and Steward, David L., 4,333,941, Cl. 424-267.000.
Stewart, Robert D.; and Gamble, Robert L., to Foster Wheeler Energy Corporation. Fluidized bed boiler utilizing precalcination of acceptors. 4,333,909, Cl. 422-141.000.

Still, Thomas W.; and Sherlock, William H. Device for improving the fuel-gas air mixture and the operation of an internal combustion engine. 4,333,441, Cl. 123-590.000.

Stockli, Andre; Castaneda, Fernando; and Stockli, Jean-Louis. Method of making boots for aquatic activities. 4,333,192, Cl. 12-142.00E.

Stockli, Jean-Louis: *See*—
Stockli, Andre; Castaneda, Fernando; and Stockli, Jean-Louis, 4,333,192, Cl. 12-142.00E.

Stokes, Vijay K., to General Electric Company. Washing machine. 4,333,323, Cl. 68-171.000.

Stoller, Keith A.: *See*—
Baumgartner, Kenneth A.; Melocik, Grant C.; and Stoller, Keith A., 4,334,176, Cl. 318-102.000.

Stolz, Hans-Peter: *See*—
Bartels, Hermann; Mez, Hans-Christian; Huber, Walter; and Stolz, Hans-Peter, 4,333,356, Cl. 73-864.210.

Stottman, Richard L.; and Smith, Peter H., to General Electric Company. Apparatus for thawing frozen food. 4,333,521, Cl. 165-63.000.

Stowe, Michael W.: *See*—
Wyland, Donald J.; and Stowe, Michael W., 4,333,825, Cl. 209-223.00A.

Strange, Robert R. Mold bottom and stool protector construction. 4,333,630, Cl. 249-135.000.

Strawson, Kenneth H.; and Spencer, Gerald, to National Research Development Corp. Apparatus for moulding magnet compacts. 4,333,895, Cl. 264-24.000.

Street, Peter C., to Tenneco Chemicals, Inc. Chemical compositions useful as paper sizing agents and method of making same. 4,333,795, Cl. 162-168.00N.

Strickland, James K., to Strickland Systems, Inc. Concrete form support structure. 4,333,289, Cl. 52-364.000.

Strickland Systems, Inc.: *See*—
Strickland, James K., 4,333,289, Cl. 52-364.000.

Strolle, Clifford H., to Du Pont de Nemours, E. I., and Company. Oxazoline diesters. 4,334,075, Cl. 548-239.000.

Stromberg-Carlson Corporation: *See*—
Slingsby, Barry, 4,334,126, Cl. 179-18.0ES.

Strouse, Joseph. Collapsible core plate construction. 4,333,616, Cl. 242-72.00R.

Stuckler, Gerd. Insertion machine for integrated circuits. 4,333,586, Cl. 221-106.000.

Sturm, Elmar; and Nyfeler, Robert, to Ciba-Geigy Corporation. 1H-Inden-1-one derivatives, their use in microbicidal compositions, and for combating microorganisms. 4,333,949, Cl. 424-300.000.

Sturm, Werner. Method and apparatus for joining thermoplastic line elements. 4,334,146, Cl. 219-492.000.

Suetsch, Franz: *See*—
Ruettiger, Wilhelm; Suetsch, Franz; and Wuerz, Albrecht, 4,333,190, Cl. 8-151.000.

Sugioka, Masumi; and Ogawa, Norihiro, to Asahi Malleble Iron Co., Ltd. Speed-shift apparatus for sheet winch. 4,333,362, Cl. 74-812.000.

Sugiura, Taku; Fukuoka, Katsuya; Inoue, Tomihiko; Kanbe, Masayoshi; and Iwama, Toshio, to Yahagi Iron Co., Ltd. Method of quickly predicting the degree of nodularity of spheroidal graphite cast iron from a molten iron sample. 4,333,512, Cl. 164-453.000.

Sugiura, Yoji: *See*—
Yoshida, Syozo; and Sugiura, Yoji, 4,333,721, Cl. 354-234.000.

Suling, Carlhans: *See*—
Konig, Joachim; and Suling, Carlhans, 4,334,046, Cl. 526-93.000.

Sullivan, Richard W.; and Nguyen, Tuan A., to Ball Corporation. Apparatus and method for drying can closures. 4,333,246, Cl. 34-23.000.

Sulzer Brothers Limited: *See*—
Hintsch, Otto, 4,333,501, Cl. 139-1.00R.

Sumitomo Electric Industries, Ltd.: *See*—
Hara, Akio, 4,333,902, Cl. 264-320.000.
Tsuji, Kazuo; Yazu, Shuji; and Hara, Akio, 4,333,986, Cl. 428-402.000.

Sumitomo Heavy Industries, Ltd.: *See*—
Iwamura, Seiji; and Tanaka, Hiromi, 4,333,751, Cl. 55-390.000.

Sun Electric Corporation: *See*—
Marten, John A., 4,333,337, Cl. 73-114.000.

Sunbeam Plastics Corporation: *See*—
Bush, Randall G., 4,333,589, Cl. 222-402.110.

Suzuki, Naoyoshi: *See*—
Shimada, Yukio; Suzuki, Naoyoshi; Ohashi, Toshio; and Inoshita, Yasushi, 4,333,606, Cl. 237-12.30A.

Suzuki, Ryoichi; and Uchiyama, Takashi, to Canon Kabushiki Kaisha. Stop control device. 4,333,720, Cl. 354-227.000.

Suzuki, Ryoichi; Uchiyama, Takashi; Hosoe, Kazuya; and Tsunekawa, Tokuichi, to Canon Kabushiki Kaisha. Display arrangement employing a multi-element light-emitting diode. 4,334,220, Cl. 340-753.000.

Suzuki, Takashi; Sawada, Hidekazu; and Asai, Tsunetomo, to Takeda Chemical Industries, Ltd. Method for producing mildiomycin. 4,334,022, Cl. 435-119.000.

Suzuki, Tameyuki; and Kubo, Akira, to Shinto Paint Co., Ltd. Reverse coating process. 4,333,807, Cl. 204-181.00T.

Swain, Richard S.: *See*—
Moore, Douglas R.; and Swain, Richard S., 4,333,376, Cl. 84-1.270.

Swanger, Lee A., to Gould Inc. Bearing material and method of making. 4,333,215, Cl. 29-149.50S.

Swanson, Guy J.; and Swanson, Morton C. Agricultural tool carrier. 4,333,534, Cl. 172-464.000.

Swanson, Morton C.: *See*—
Swanson, Guy J.; and Swanson, Morton C., 4,333,534, Cl. 172-464.000.

Swartz, Harold L.: *See*—
Grimes, Terrence L.; and Swartz, Harold L., 4,334,179, Cl. 318-661.000.

Sweeney, George A.: *See*—
Wing, Phillip L.; and Sweeney, George A., 4,333,843, Cl. 252-75.000.

Sweeney, William T.: *See*—
Beck, Jeffrey L.; and Sweeney, William T., 4,333,499, Cl. 137-812.000.

Sweigart, Robert L., Jr., to Associated Plastics, Inc. Mechanism for locking two halves of an underground vault. 4,333,580, Cl. 220-5.00A.

Swiss Aluminium Ltd.: *See*—
Bloeck, Siegfried; Hofling, Erich; Luthi, Rudolf; and Diemi, Werner, 4,333,582, Cl. 220-66.000.

Sybron Corporation: *See*—
Kocache, Riad M. A.; and Holman, Danny F., 4,333,811, Cl. 204-195.00S.

Szabo, Gabor: *See*—
Toke, Laszlo; Szabo, Gabor T.; Szabo, Gabor; Nagy, Lajos; and Rusznak, Istvan, 4,334,103, Cl. 568-631.000.

Szabo, Gabor T.: *See*—
Toke, Laszlo; Szabo, Gabor T.; Szabo, Gabor; Nagy, Lajos; and Rusznak, Istvan, 4,334,103, Cl. 568-631.000.

Szonn, Bodo: *See*—
Muller, Heinz; Jauchen, Peter; Szonn, Bodo; and Schulze, Rolf, 4,333,449, Cl. 128-155.000.

Tachibana, Kanji: *See*—
Karino, Kimiji; Osawa, Tadao; Nagano, Masami; Sakuma, Tokihiko; Kanazawa, Yuiti; Kuroha, Tunemitu; and Tachibana, Kanji, 4,333,890, Cl. 261-41.00D.

Tachikawa, Hiromichi: *See*—
Kitajima, Masao; Tachikawa, Hiromichi; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,334,006, Cl. 430-254.000.

Tack, Carl E.; and Guins, Sergei G., to TransDyne, Inc. Retainer railway car truck bolster spring. 4,333,403, Cl. 105-197.00R.

Tacke, Michael: *See*—
Dorr, Karl H.; Diekmann, Helmut; Grimm, Hugo; Sander, Ulrich; Tacke, Michael; and Weber, Waldemar, 4,333,917, Cl. 423-522.000.

Tada, Naofumi; Kimura, Hiroshi; and Ogata, Hisanao, to Hitachi, Ltd. Internal cooling type superconductor. 4,334,123, Cl. 174-15.00S.

Taffer, Brenda W. Feed control system for automatic fastener drivers. 4,333,367, Cl. 81-430.000.

Taga, Yutaka; and Morisawa, Kunio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Lubricating oil transfer construction in an automatic transmission for vehicles. 4,333,359, Cl. 74-467.000.

Tager, Steven E. Compensatory-corrective orthopedic foot devices. 4,333,472, Cl. 128-581.000.

Taisho Pharmaceutical Co., Ltd.: *See*—
Tamai, Masaharu; Adachi, Takashi; Morimoto, Shigeo; Oguma, Kiyoshi; Hanada, Kazunori; and Omura, Sadafumi, 4,333,879, Cl. 549-549.000.

TAK PLAST Company: *See*—
Marinelli, Lamberto, 4,333,247, Cl. 36-11.500.

Takagi, Hidehiko; Hayashi, Hisao; Ogawa, Kazuo; and Kanaya, Yoshihiro, to Rinnai Kabushiki Kaisha. Arrangement for cooking either with a heat source or a microwave source. 4,334,137, Cl. 219-10.55F.

Takahashi, Michiko: *See*—
Shirato, Yoshiaki; Takatori, Yasushi; Hara, Toshitami; Nishimura, Yukuo; and Takahashi, Michiko, 4,334,234, Cl. 346-140.00R.

Takaishi, Takeo: *See*—
Maki, Hiroya; Furusawa, Taketoshi; and Takaishi, Takeo, 4,333,908, Cl. 422-61.000.

Takami, Satoshi; Hagiwara, Teruo; Kando, Toru; and Kuroki, Yoshifumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Multiple flash adaptor. 4,333,719, Cl. 354-132.000.

Takao, Hisashi: *See*—
Shimizu, Yasuo; Takao, Hisashi; Asano, Shoji; Shimada, Shuya; and Kikkawa, Kazutoshi, 4,334,066, Cl. 544-149.000.

Takatori, Yasushi: *See*—
Shirato, Yoshiaki; Takatori, Yasushi; Hara, Toshitami; Nishimura, Yukuo; and Takahashi, Michiko, 4,334,234, Cl. 346-140.00R.

Takeda Chemical Industries, Ltd.: *See*—
Suzuki, Takashi; Sawada, Hidekazu; and Asai, Tsunetomo, 4,334,022, Cl. 435-119.000.

Takemura, Yasuhiko: *See*—
Kotani, Teizo; Takemura, Yasuhiko; and Miyabayashi, Toshio, 4,334,044, Cl. 525-379.000.

Takenaka, Shigeo; Hamano, Eizaburou; and Koshigoe, Shinpei, to Tokyo Shibaura Denki Kabushiki Kaisha. Electron gun structure. 4,334,169, Cl. 313-414.000.

Taketomi, Bunsaku. Sewing machine. 4,333,410, Cl. 112-162.000.

Takeuchi, Hiroshi: *See*—
Ito, Yukio; Nagatsuma, Kazuyuki; Jyomura, Sigeru; Ashida, Sakichi; and Takeuchi, Hiroshi, 4,333,842, Cl. 252-62.900.

Takeuchi, Osamu; Aoki, Kiyoshi; and Fujii, Yuichi, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Method and apparatus for compensating for local temperature difference of steel product. 4,333,777, Cl. 148-128.000.

Talon, Inc.: *See*—
Orr, David A.; Gala, Hiren S.; and Scagnelli, George J., 4,333,232, Cl. 29-767.000.

Tamai, Masaharu; Adachi, Takashi; Morimoto, Shigeo; Oguma, Kiyoshi; Hanada, Kazunori; and Omura, Sadafumi, to Taisho Pharmaceu-

tical Co., Ltd. Epoxysuccinic acid derivatives. 4,333,879, Cl. 549-549.000.
Tamanaga, Shinichi: *See—*
Koizumi, Hajime; Toyama, Kozo; Kobayashi, Mikio; Hatano, Hajime; Saeki, Toshio; Mizukoshi, Kaoru; Tamanaga, Shinichi; Miyakawa, Keizo; and Kato, Tomoyasu, 4,333,285, Cl. 52-252.000.
Tamura, Masuhiko: *See—*
Matsumoto, Mitsuo; and Tamura, Masuhiko, 4,334,042, Cl. 525-339.000.
Yoshimura, Noriaki; and Tamura, Masuhiko, 4,334,117, Cl. 585-509.000.
Tamura, Shuichi, to Canon Kabushiki Kaisha. Camera having focus detection device. 4,333,717, Cl. 354-25.000.
Tanaka, Hiroichiro; and Nagatani, Yasuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Digital speed control method and apparatus. 4,334,175, Cl. 318-66.000.
Tanaka, Hiromi: *See—*
Iwamura, Seiji; and Tanaka, Hiromi, 4,333,751, Cl. 55-390.000.
Tanaka, Kimio: *See—*
Ishida, Toshihiko; and Tanaka, Kimio, 4,333,620, Cl. 242-199.000.
Tanaka, Motomichi, to Nippon Electric Co., Ltd. Pre-detection maximal ratio combining system for diversity reception of radio frequency signals. 4,334,316, Cl. 455-139.000.
Tanaka, Takanori: *See—*
Morishita, Masanobu; and Tanaka, Takanori, 4,334,238, Cl. 358-43.000.
Tanaka, Toshiaki; and Etoh, Yukihiro, to Nissan Motor Company, Limited. Internal combustion engine. 4,333,428, Cl. 123-198.00F.
Tanca, Michael C., to Combustion Engineering, Inc. Soot blower using fuel gas as blowing medium. 4,333,742, Cl. 48-77.000.
Tani Saw Mfg. Co., Ltd.: *See—*
Matsuda, Eiji, 4,333,371, Cl. 83-169.000.
Tarman, Paul B.: *See—*
Chynoweth, David P.; and Tarman, Paul B., 4,334,026, Cl. 435-163.000.
Tasedan, Robert T. Combination sand-blasting and vacuum apparatus. 4,333,277, Cl. 51-425.000.
Taub, Rae: *See—*
Buhs, Rudolf P.; Jacob, Theodore A.; Miwa, Gerald; Sestokas, Elena; Taub, Rae; and Walsh, John S., 4,333,925, Cl. 424-181.000.
Taylor, Donald F. Automatic dump valve. 4,333,828, Cl. 210-113.000.
Taylor, John A.: *See—*
Porter, Christopher H.; and Taylor, John A., 4,333,906, Cl. 264-40.300.
Taylor, William T. Downhole fishing jar mechanism. 4,333,542, Cl. 175-299.000.
TDK Electronics Co., Ltd.: *See—*
Ishida, Toshihiko; and Tanaka, Kimio, 4,333,620, Cl. 242-199.000.
Technicon Instruments Corporation: *See—*
Carney, James A.; and McGregor, Adrienne R., 4,333,918, Cl. 424-1.000.
Tedeschi, Robert J., to Air Products and Chemicals, Inc. Process for preparing halovinyl cyclopropane carboxylic acid salts. 4,334,091, Cl. 562-506.000.
Teitin Limited: *See—*
Urasaki, Takanori; Hirabayashi, Yasuji; Ogasawara, Makoto; and Inata, Hiroo, 4,333,907, Cl. 264-290.200.
Tektronix, Inc.: *See—*
Shores, David H., 4,334,201, Cl. 333-202.000.
Theus, John G., 4,334,250, Cl. 360-45.000.
Telectronics Pty. Ltd.: *See—*
Jeffcoat, Keith W.; and Wickham, Geoffrey G., 4,333,469, Cl. 128-419.00F.
Teleflex Incorporated: *See—*
Spease, Arthur L., 4,333,361, Cl. 74-501.00P.
Telefonaktiebolaget L M Ericsson: *See—*
Ekdahl, Per A. A.; and Moller, Fred L., 4,334,257, Cl. 361-119.000.
Tenneco Chemicals, Inc.: *See—*
Street, Peter C., 4,333,795, Cl. 162-168.00N.
Terrell, Ross C.; and Hansen, Kirsten, to Airco, Inc. Method for the dehalogenation of ethers. 4,334,105, Cl. 568-682.000.
Te-Son, Chen: *See—*
Pin-Huang, Lin, 4,333,259, Cl. 46-132.000.
Texaco Inc.: *See—*
Brown, William F.; and Bieber, Albert G., 4,333,824, Cl. 208-326.000.
Hammond, Kenneth G., 4,334,109, Cl. 568-841.000.
Knifton, John F., 4,334,092, Cl. 562-517.000.
Knifton, John F., 4,334,093, Cl. 562-517.000.
Knifton, John F., 4,334,094, Cl. 562-517.000.
Texas Instruments Incorporated: *See—*
Boulanger, Henry J.; and McGuirk, Andrew C., 4,334,210, Cl. 337-343.000.
McDonald, Wylie W., 4,334,280, Cl. 364-710.000.
Mings, Joe D., 4,334,256, Cl. 361-56.000.
Ponder, James E., 4,334,293, Cl. 365-190.000.
Ulug, Mehmet E., 4,334,306, Cl. 370-94.000.
Textron, Inc.: *See—*
Drees, Jan M.; Dooley, Larry W.; and Neathery, William D., 4,333,728, Cl. 416-134.00A.
Howe, Ralph S., Jr., 4,333,694, Cl. 308-187.200.
Zeanwick, Ernest J., 4,333,745, Cl. 55-97.000.
Thermoplastics Incorporated: *See—*
Munoz, Donald L.; Grote, Daniel A.; Bronder, David G.; and Weis, Gerald J., 4,333,678, Cl. 296-39.00R.
Theurer, Kurt: *See—*
Decker, Wilmot H.; and Theurer, Kurt, 4,334,102, Cl. 568-621.000.
Theus, John G., to Tektronix, Inc. MFM data encoder with write precompensation. 4,334,250, Cl. 360-45.000.
Thieman, Graham F.: *See—*
Arthur, James C.; and Thieman, Graham F., 4,333,672, Cl. 285-382.200.
Thies, Edward J.; and Michlin, Norman, to Michlin Chemical Corporation. Adsorbent cartridge for the exhaust of diazo process machines. 4,333,752, Cl. 55-387.000.
Thinschmidt, Hans; and Scheiterer, Eduard, to Siemens Aktiengesellschaft. Test facility for error diagnosis in multi-computer systems, particularly in multi-micro-computer systems. 4,334,308, Cl. 371-29.000.
Thirouard, Michel: *See—*
Arquie, Louis; Bricot, Claude; Lehureau, Jean-Claude; Thirouard, Michel; Le Merer, Jean-Pierre; and Leterme, Dominique, 4,334,300, Cl. 369-46.000.
Thomas, James S.: *See—*
Boney, Joel F.; Rupp, Edward J., II; and Thomas, James S., 4,334,268, Cl. 364-200.000.
Thomas, Ronald; and Smith, Donald H., to Thomas, Ronald. Combined A.C./D.C. electric lawn mower. 4,333,302, Cl. 56-10.500.
Thome, David G.: *See—*
Sciaraffa, Michael A.; Thome, David G.; and Vogt, Clifford M., 4,333,979, Cl. 428-179.000.
Thomson-Brandt: *See—*
Tinet, Claude; and Lemonon, Claire, 4,334,007, Cl. 430-270.000.
Thomson-CSF: *See—*
Arquie, Louis; Bricot, Claude; Lehureau, Jean-Claude; Thirouard, Michel; Le Merer, Jean-Pierre; and Leterme, Dominique, 4,334,300, Cl. 369-46.000.
Dubois, Jean-Claude; Zann, Annie; Billard, Jean; and Hareng, Michel, 4,333,709, Cl. 350-350.00R.
Thorborg, Kjeld, to ASEA Aktiebolag. Thyristor inverter with inverter bridge and common turn-off circuit for inverter thyristors. 4,334,265, Cl. 363-72.000.
Thorsteinson, Erlind M.: *See—*
Decker, Harry J.; and Thorsteinson, Erlind M., 4,333,858, Cl. 252-455.00R.
Thrush Incorporated: *See—*
Roberts, Peter, 4,333,545, Cl. 181-282.000.
Thumm, Heinz, to Thumm Olhydraulische Antriebe GmbH, Firma. Rotational mechanism for an excavator grab bucket. 4,333,676, Cl. 294-88.000.
Thumm Olhydraulische Antriebe GmbH, Firma: *See—*
Thumm, Heinz, 4,333,676, Cl. 294-88.000.
Thurow, Russel E. Chimney cleaner. 4,333,200, Cl. 15-243.000.
Tinet, Claude; and Lemonon, Claire, to Thomson-Brandt. Process of making an optically recordable and readable information carrier and the carrier obtained by this process. 4,334,007, Cl. 430-270.000.
Tire-Tronics, Inc.: *See—*
Frazier, John D.; Grandfield, Wilmur G.; and Brainerd, Michael G., 4,334,215, Cl. 340-539.000.
Tkac, Alexander; and Cvengros, Jan, to Slovenska vysoka skola technicka. Method of treating waste engine oils. 4,333,822, Cl. 208-184.000.
TMC Corporation: *See—*
Leichtfried, Friedrich; and Himmetsberger, Alois, 4,333,667, Cl. 280-605.000.
Todd, Michael A. Capsule for storing written information. 4,333,562, Cl. 206-37.000.
Toke, Laszlo; Szabo, Gabor T.; Szabo, Gabor; Nagy, Lajos; and Ruszak, Istvan, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Process for heterogeneous nucleophilic substitution reactions. 4,334,103, Cl. 568-631.000.
Tokiwa Chemical Industries, Limited: *See—*
Nakai, Tadanobu, 4,333,471, Cl. 128-505.000.
Tokuse, Masahiro: *See—*
Iwai, Tadashi; Kawahito, Takashi; and Tokuse, Masahiro, 4,333,915, Cl. 423-324.000.
Iwai, Tadashi; Kawahito, Takashi; and Tokuse, Masahiro, 4,333,916, Cl. 423-371.000.
Tokyo: *See—*
Watanabe, Kenkichi, 4,333,296, Cl. 53-64.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Murakami, Teruo, 4,334,233, Cl. 346-135.100.
Takenaka, Shigeo; Hamano, Eizaburou; and Koshigoe, Shinpei, 4,334,169, Cl. 313-414.000.
Tanaka, Hiroichiro; and Nagatani, Yasuo, 4,334,175, Cl. 318-66.000.
Tomori, Yasumasa, to Asahi Kogaku Kogyo Kabushiki Kaisha. Change-over device for zoom lens. 4,333,712, Cl. 350-430.000.
Toray Industries, Incorporated: *See—*
Okamoto, Miyoshi; and Fushida, Mineto, 4,333,976, Cl. 428-91.000.
Toriu, Jirou, to Mitsubishi Denki Kabushiki Kaisha. Magnetic recording and reproducing head arrangement. 4,334,252, Cl. 360-104.000.
Towers, Frederic C. Securities valuation system. 4,334,270, Cl. 364-300.000.
Towmotor Corporation: *See—*
Baumgartner, Kenneth A.; Melocik, Grant C.; and Stoller, Keith A., 4,334,176, Cl. 318-102.000.
Toyama, Kozo: *See—*
Koizumi, Hajime; Toyama, Kozo; Kobayashi, Mikio; Hatano, Hajime; Saeki, Toshio; Mizukoshi, Kaoru; Tamanaga, Shinichi; Miyakawa, Keizo; and Kato, Tomoyasu, 4,333,285, Cl. 52-252.000.

Toyo Engineering Corporation: *See*—
Konoki, Keizo; Nobue, Michio; Fukui, Akito; and Inoue, Shigeru, 4,334,096, Cl. 564-72.000.
Toyo Seikan Kaisha, Limited: *See*—
Matsuno, Kenji; and Funamoto, Hiroyuki, 4,334,138, Cl. 219-64.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Koyama, Kenji; Ohno, Syotaro; and Fukuda, Mitsutoshi, 4,333,870, Cl. 260-112.00B.
Toyoda Gosei Co., Ltd.: *See*—
Hayashi, Keizo, 4,333,221, Cl. 29-413.000.
Toyoda, Kenichi: *See*—
Inaba, Seiuemon; Shimajiri, Tokiji; and Toyoda, Kenichi, 4,333,363, Cl. 74-826.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Shirai, Kenji, 4,333,550, Cl. 188-72.200.
Taga, Yutaka; and Morisawa, Kunio, 4,333,359, Cl. 74-467.000.
Trade Finance International: *See*—
Sorensen, Jens O., 4,333,312, Cl. 60-641.700.
Trailigaz, Compagnie Generale de l'Ozone: *See*—
Werner, Brandin, 4,333,834, Cl. 210-219.000.
Tran, Danh C.; Macedo, Pedro B.; Simmons, Joseph H.; Simmons, Catherine J.; and Lagakos, Nicholas, to Macedo, P. B.; and Litovitz, T. A. Fixation by anion exchange of toxic materials in a glass matrix. 4,333,847, Cl. 252-629.000.
TransDyne, Inc.: *See*—
Tack, Carl E.; and Guins, Sergei G., 4,333,403, Cl. 105-197.00R.
Trefilunion S.A.: *See*—
Bernot, Jean, 4,333,275, Cl. 51-320.000.
Trenkle, Robert W.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Wilson, Richard A.; Schmitt, Frederick L.; Vock, Manfred H.; Granda, Edward J.; Vinals, Joaquin; Kiwala, Jacob; and Schreiber, William L., 4,334,098, Cl. 568-347.000.
Trio Kabushiki Kaisha: *See*—
Otao, Kazumasa, 4,334,197, Cl. 330-268.000.
Trzecieski, Jan, to Kirk Chemicals. Creamy milk ice cream and process for the production thereof. 4,333,953, Cl. 426-34.000.
Trzecieski, Jan, to Kirk Chemicals. Soft ice cream and process for production thereof. 4,333,954, Cl. 426-41.000.
Tsubouchi, Natsuro: *See*—
Abe, Haruhiko; Nagatomo, Masao; Tsubouchi, Natsuro; Harada, Hiroshi; and Mitsuhashi, Junichi, 4,333,226, Cl. 29-576.00B.
Tsuchiya, Yukio: *See*—
Shimada, Kunihiko; and Tsuchiya, Yukio, 4,334,127, Cl. 179-115.50R.
Tsuji, Kazuo; Yazu, Shuji; and Hara, Akio, to Sumitomo Electric Industries, Ltd. Diamond sintered compact wherein crystal particles are uniformly orientated in a particular direction and a method for producing the same. 4,333,986, Cl. 428-402.000.
Tsuji, Tatsumi: *See*—
Hayashi, Tatsuo; Itoh, Ryouichi; and Tsuji, Tatsumi, 4,333,897, Cl. 264-40.600.
Tsujikawa, Teruaki: *See*—
Mifune, Hiroyuki; Ishiguro, Shoji; Shishido, Tadao; Fuseya, Yoshiharu; and Tsujikawa, Teruaki, 4,334,010, Cl. 430-551.000.
Tsunekawa, Tokuichi: *See*—
Sakane, Toshio; Hosoe, Kazuya; Tsunekawa, Tokuichi; Kinoshita, Takao; and Kawabata, Takashi, 4,333,716, Cl. 354-25.000.
Suzuki, Ryoichi; Uchiyama, Takashi; Hosoe, Kazuya; and Tsunekawa, Tokuichi, 4,334,220, Cl. 340-753.000.
Tu, Hosheng, to UOP Inc. Process for use of a high octane FCC catalysts. 4,333,821, Cl. 208-120.000.
Tubbs, Joseph T.: *See*—
Funcik, Jack F.; Bennet, Joseph C.; Tubbs, Joseph T.; and Schneider, Thomas E., 4,333,230, Cl. 29-749.000.
Tufts, Wesley M.: *See*—
Heinze, Walter O.; and Tufts, Wesley M., 4,333,185, Cl. 4-319.000.
Tummers, Gerardus L. J.: *See*—
McNeely, Gerald W.; and Tummers, Gerardus L. J., 4,333,339, Cl. 116-217.000.
Turnbull, David F., to Burroughs Corporation. Disc eccentricity measuring means. 4,334,276, Cl. 364-561.000.
Turner, Milton; and Smith, Julian M. Recumbent vehicle. 4,333,664, Cl. 280-261.000.
Turney, William J.; and Piesinger, Gregory H., to Motorola, Inc. Circuit for automatic gain control with constant response time. 4,334,185, Cl. 323-280.000.
Tyree, Lewis, Jr. CO_2 Freezer. 4,333,318, Cl. 62-374.000.
UBE Industries, Ltd.: *See*—
Iwai, Tadashi; Kawahito, Takashi; and Tokuse, Masahiro, 4,333,915, Cl. 423-324.000.
Iwai, Tadashi; Kawahito, Takashi; and Tokuse, Masahiro, 4,333,916, Cl. 423-371.000.
Uchida, Motokazu: *See*—
Yanadori, Michio; Hasegawa, Kengo; and Uchida, Motokazu, 4,333,520, Cl. 165-59.000.
Uchida, Takashi: *See*—
Miyahara, Nobufumi; and Uchida, Takashi, 4,334,166, Cl. 310-268.000.
Uchiyama, Takashi: *See*—
Suzuki, Ryoichi; and Uchiyama, Takashi, 4,333,720, Cl. 354-227.000.
Suzuki, Ryoichi; Uchiyama, Takashi; Hosoe, Kazuya; and Tsunekawa, Tokuichi, 4,334,220, Cl. 340-753.000.
Uchiyama, Yasuji: *See*—
Okumura, Takatoshi; Nakada, Akira; Uchiyama, Yasuji; Aoki, Eiichiro; Yamaga, Eiichi; and Oya, Akiyoshi, 4,333,374, Cl. 84-1.010.
Udelhofen, John H.: *See*—
Basalay, Robert J.; and Udelhofen, John H., 4,334,085, Cl. 564-367.000.
Uetani, Yoshio: *See*—
Ishida, Osamu; Uetani, Yoshio; and Matsushima, Seiichi, 4,333,995, Cl. 429-172.000.
Ueyanagi, Jisaburo: *See*—
Mifune, Hiroyuki; Shishido, Tadao; Ishiguro, Shoji; and Ueyanagi, Jisaburo, 4,334,014, Cl. 430-611.000.
Uffner, William E., to Owens-Corning Fiberglas Corporation. Asphalt composition. 4,333,866, Cl. 524-534.000.
Uhrig, Heinz: *See*—
Deubel, Reinhold; Opitz, Konrad; Kruse, Hubert; Schneider, Manfred; and Uhrig, Heinz, 4,333,732, Cl. 8-527.000.
Ulug, Mehmet E., to Texas Instruments Incorporated. Transparent intelligent network for data and voice. 4,334,306, Cl. 370-94.000.
Union Carbide Corporation: *See*—
Colon, Ismael, 4,334,081, Cl. 560-130.000.
Decker, Harry J.; and Thorsteinson, Erlind M., 4,333,858, Cl. 252-455.00R.
Fuderer, Andrija, 4,333,744, Cl. 55-25.000.
Lee, Young-Jin, 4,334,112, Cl. 570-207.000.
Louzos, Demetrios V., 4,333,996, Cl. 429-191.000.
Urry, Lewis F., 4,333,994, Cl. 429-94.000.
Warren, Barbara K., 4,333,852, Cl. 252-429.00R.
United Kingdom Atomic Energy Authority: *See*—
Mills, Alfred L.; Weatherley, Laurence R.; and Crofts, John A., 4,333,912, Cl. 423-20.000.
United States of America
Agriculture: *See*—
Kurtzman, Ralph H., Jr., 4,333,757, Cl. 71-5.000.
Army: *See*—
Blais, Marcel, 4,334,060, Cl. 536-35.000.
DeSantis, Charles M., 4,334,187, Cl. 324-58.00R.
Montgomery, Donald N., 4,333,386, Cl. 89-33.0SF.
Morrison, Clyde A.; and Sattler, Joseph P., 4,333,344, Cl. 73-584.000.
Rittenbach, Otto E., 4,334,194, Cl. 328-42.000.
Stansbury, LeRoy, Jr.; and Donovan, William F., 4,333,383, Cl. 89-7.000.
Energy: *See*—
Dacus, Michael W.; and Cole, Jack H., 4,333,355, Cl. 73-861.910.
Vermeulen, Theodore; Grens, Edward A., II; and Holten, Ronald R., 4,333,815, Cl. 208-10.000.
Navy: *See*—
Boblett, Arthur P., 4,334,229, Cl. 343-767.000.
Bond, James W.; and Whitehouse, Harper J., 4,334,277, Cl. 364-703.000.
Davis, Sydney; and Malakhoff, Alexander, 4,333,413, Cl. 114-67.00A.
Holt, Lloyd J.; and Panlaqui, Clayton E., 4,333,382, Cl. 89-1.806.
Katz, Thomas J.; Nair, Mridula; and Lee, Steven J., 4,334,048, Cl. 526-170.000.
McNelia, John F.; and Peterson, Carl R., 4,333,400, Cl. 102-348.000.
Montgomery, Francis E.; Short, James E., Jr.; and Weaver, William J., 4,333,737, Cl. 23-297.000.
U.S. Philips Corporation: *See*—
Gieschen, Kurt; and Reinger, Friedrich, 4,334,155, Cl. 250-490.000.
Post, Sieghard, 4,334,208, Cl. 336-192.000.
Snijders, Wilfred A. M., 4,334,128, Cl. 179-170.200.
Wittekoek, Stefan; and Fahner, Theodorus A., 4,334,139, Cl. 219-121.0EW.
United States Shoe Corporation, The: *See*—
Bartneck, Hans, 4,333,193, Cl. 12-142.0RS.
United Technologies Corporation: *See*—
Arrigoni, John P., 4,333,239, Cl. 33-174.00C.
Gilden, Meyer; Cullen, Donald E.; and Grudkowski, Thomas W., 4,333,342, Cl. 73-516.00R.
Healy, Herbert C., 4,333,992, Cl. 429-17.000.
Slaughter, Edward R., 4,333,216, Cl. 29-157.00R.
Universal-Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG: *See*—
Kuhnert, Gottfried, 4,333,320, Cl. 66-63.000.
University of Nottingham, The: *See*—
Speakman, John G.; and Wilkinson, Nicholas P., 4,333,851, Cl. 252-429.00B.
University of Rochester, The: *See*—
Ham, David O., 4,334,199, Cl. 372-57.000.
UOP Inc.: *See*—
Antos, George J., 4,333,854, Cl. 252-439.000.
Antos, George J., 4,333,856, Cl. 252-441.000.
Coste, Angelo C., 4,333,818, Cl. 208-101.000.
Kulprathipanja, Santi; and Bloch, Herman S., 4,333,768, Cl. 127-46.200.
Kulprathipanja, Santi; and Neuzil, Richard W., 4,333,769, Cl. 127-46.200.
Neuzil, Richard W.; and Fergin, Richard L., 4,333,770, Cl. 127-46.300.
O'Brien, Dennis E., 4,333,817, Cl. 208-101.000.
Priegnitz, James W., 4,333,740, Cl. 44-56.000.
Pujado, Peter R., 4,333,801, Cl. 203-94.000.

Scheifele, Clifford A., Jr., 4,333,819, Cl. 208-101.000.
Scheifele, Clifford A., Jr., 4,333,820, Cl. 208-101.000.
Tu, Hosheng, 4,333,821, Cl. 208-120.000.
Winter, George R., III, 4,333,823, Cl. 208-325.000.

Upjohn Company, The: *See—*
Dai, Shenghong A., 4,334,106, Cl. 568-719.000.
Nelson, Stephen J., 4,333,883, Cl. 260-544.00C.

Uram, Robert, to Westinghouse Electric Corp. Combined cycle electric power plant with feedforward afterburner temperature setpoint control. 4,333,310, Cl. 60-39.18B.

Urasaki, Takanori; Hirabayashi, Yasuji; Ogasawara, Makoto; and Inata, Hiroo, to Teitin Limited. Biaxially oriented wholly aromatic polyester film. 4,333,907, Cl. 264-290.200.

Urry, Lewis F., to Union Carbide Corporation. Cell employing a coiled electrode assembly. 4,333,994, Cl. 429-94.000.

Utagawa, Giichi: *See—*
Iseya, Shigeo; and Utagawa, Giichi, 4,333,245, Cl. 33-438.000.

Utsch, Francis V.: *See—*
de la Burde, Roger Z.; Aument, Patrick E.; and Utsch, Francis V., 4,333,483, Cl. 131-352.000.

Valentin, Jean P.: *See—*
Besson, Raymond J.; and Valentin, Jean P., 4,334,168, Cl. 310-343.000.

Van Dyk & Company, Inc.: *See—*
Conner, Donald E., 4,333,920, Cl. 424-59.000.

Van Baalen, Joseph M.: *See—*
Gabriel, Melvin E.; and Van Baalen, Joseph M., 4,334,173, Cl. 315-399.000.

Vandenbossche, Jean-Jacques H.: *See—*
Bugaut, Andree; Shahin, Majdi M.; Vandenbossche, Jean-Jacques H.; and Kalopissis, Gregoire, 4,333,730, Cl. 8-407.000.

Van De Puy, Michael; Anello, Louis G.; and Robinson, Martin A., to Allied Corporation. Preparation of hexafluoroacetone from hexafluorothioacetone dimer. 4,334,099, Cl. 568-386.000.

van der Burg, Willem J., to Akzona Incorporated. Antianxiety compositions of 10-hydroxy 1,2,3,4,10,14b-hexahydrodibenzo[c,f]pyrazino-1,2a azepines and a method of use thereof. 4,333,935, Cl. 424-250.000.

Vanderslice, James T.: *See—*
Davidge, Ronald V.; Queener, Carl A.; and Vanderslice, James T., 4,333,639, Cl. 271-3.100.

Van Eenam, Donald N., to Monsanto Company. Substrate treating compositions. 4,333,971, Cl. 427-389.900.

Van Peppen, Jan F., to Allied Chemical Corporation. Catalytic purification of phenol. 4,334,107, Cl. 568-749.000.

Van Steenwyk, William E.: *See—*
Hardy, Raymond D.; and Van Steenwyk, William E., 4,333,679, Cl. 296-161.000.

Varadhachary, Seevaram N.: *See—*
Kwart, Harold; and Varadhachary, Seevaram N., 4,333,987, Cl. 428-419.000.

Varel, Daniel W., to Varel Manufacturing Company. Method for manufacturing a rotary drill bit having a solid forged, unitary body. 4,333,364, Cl. 76-108.00A.

Varel Manufacturing Company: *See—*
Varel, Daniel W., 4,333,364, Cl. 76-108.00A.

Varosepitesi Tudomanyos es TervezoIntezet: *See—*
Plosz, Sandor; Babos, Katalin; Rozsavolgyi, Karoly; and Felfoldy, Lajos, 4,333,837, Cl. 210-602.000.

Varshney, Subhash C.: *See—*
Bourgeois, David R.; Ryan, James A.; and Varshney, Subhash C., 4,334,307, Cl. 371-16.000.

Vat Aktiengesellschaft fur Vakuum-Apparate-Technik: *See—*
Bosch, Hubert, 4,333,631, Cl. 251-159.000.

Vaughan, David E. W.; and Barrett, Michael G., to W. R. Grace & Co. High silica faujasite polymorph - CSZ-3 and method of synthesizing. 4,333,859, Cl. 252-455.00Z.

Vaughn, George A.; and Fuchs, Francis J., Jr., to AMF Incorporated. Racket string clamp. 4,333,649, Cl. 273-73.00D.

Veb Chemieanlagenbaukombinat Leipzig-Grimma: *See—*
Hoppe, Klaus; Muller, Jurgen; Keller, Jurgen; Kulbe, Bernd; Lessig, Klaus; Berlin, Christian; and Danke, Eckhard, 4,333,894, Cl. 261-96.000.

Veb Wirkmaschinenbau Karl-Marx-Stadt: *See—*
Schneider, Manfred; and Schubert, Frank, 4,333,321, Cl. 66-192.000.

Veit, Richard E.: *See—*
Griswold, David E.; and Veit, Richard E., 4,333,495, Cl. 137-484.200.

Velenyi, Louis J.; and Krupa, Andrew S., to Standard Oil Company. Dehydrogenation using promoted molybdenum-copper-tin catalysts. 4,334,116, Cl. 585-440.000.

Verco Manufacturing, Inc.: *See—*
Morton, Virgil R., 4,333,280, Cl. 52-167.000.

Verhulst, Eduard M.: *See—*
Beck, Heinz; Frassek, Karl H.; Giezen, Egenius A.; and Verhulst, Eduard M., 4,334,038, Cl. 525-207.000.

Vermeulen, Theodore; Grens, Edward A., II; and Holten, Ronald R., to United States of America, Energy. Coal liquefaction in an inorganic-organic medium. 4,333,815, Cl. 208-10.000.

Vianova Kunstharz, A.G.: *See—*
Zuckert, Bertram, 4,333,864, Cl. 525-501.500.
Zuckert, Bertram, 4,333,865, Cl. 523-410.000.

Villari, Frank K.; and Cianci, James P., to Kendall Company, The. Urine receptacle with a tubular section to retain an antimicrobial agent. 4,333,480, Cl. 128-767.000.

Vinals, Joaquin: *See—*
Mookherjee, Braja D.; Trenkle, Robert W.; Wilson, Richard A.; Schmitt, Frederick L.; Vock, Manfred H.; Granda, Edward J.; Vinals, Joaquin; Kiwala, Jacob; and Schreiber, William L., 4,334,098, Cl. 568-347.000.

Vinther, Knud. Expansion element. 4,333,357, Cl. 74-110.000.

Viret, Jean-Louis: *See—*
Bracco, Umberto; and Viret, Jean-Louis, 4,333,959, Cl. 426-614.000.

Vivitar Corporation: *See—*
Kreitzer, Melvyn H., 4,333,714, Cl. 350-460.000.

Vock, Manfred H.: *See—*
Mookherjee, Braja D.; Trenkle, Robert W.; Wilson, Richard A.; Schmitt, Frederick L.; Vock, Manfred H.; Granda, Edward J.; Vinals, Joaquin; Kiwala, Jacob; and Schreiber, William L., 4,334,098, Cl. 568-347.000.

Vogt, Clifford M.: *See—*
Sciaraffa, Michael A.; Thome, David G.; and Vogt, Clifford M., 4,333,979, Cl. 428-179.000.

Vogt, Herwart C.: *See—*
Patton, John T., Jr.; and Vogt, Herwart C., 4,334,032, Cl. 521-115.000.
Patton, John T., Jr.; Vogt, Herwart C.; and Parekh, Manher, 4,334,052, Cl. 528-52.000.

Voith S.A.: *See—*
Peroutka, Fritz; and Hirschfelder, Helmut, 4,333,836, Cl. 210-404.000.

Volkswagenwerk Aktiengesellschaft: *See—*
Lohner, Ingolf; Barnert, Konrad; and Stein, Gunter, 4,333,437, Cl. 123-502.000.

Vollers, Charles S.: *See—*
Myers, John D.; and Vollers, Charles S., 4,333,848, Cl. 252-301.40P.

Vortec Corporation: *See—*
Peter, Joseph E., 4,333,754, Cl. 62-5.000.

Vosbikian, Joseph. Sponge mop. 4,333,198, Cl. 15-119.00A.

W. R. Grace & Co.: *See—*
Vaughan, David E. W.; and Barrett, Michael G., 4,333,859, Cl. 252-455.00Z.

W. Schlafhorst & Co.: *See—*
Rohner, Joachim, 4,333,201, Cl. 15-301.000.

Wabash, Inc.: *See—*
Wolf, Ronald J., 4,333,442, Cl. 123-599.000.

Wade, Shirley A.: *See—*
Holtman, Dennis C.; and Wade, Shirley A., 4,333,462, Cl. 128-287.000.

Wagner, Fritz: *See—*
Klein, Joachim; and Wagner, Fritz, 4,334,027, Cl. 435-178.000.

Wagner, Rudiger: *See—*
Preuss, Wolfgang; Bahn, Michael; Schmid, Rolf; and Wagner, Rudiger, 4,333,880, Cl. 260-397.100.

Wahlco, Inc.: *See—*
Southam, Barry, 4,333,746, Cl. 55-106.000.

Wahling, Wilfried: *See—*
Klank, Otto; and Wahling, Wilfried, 4,334,318, Cl. 455-195.000.

Wajtkowicz, Joseph A., to Bethlehem Steel Corporation. Cutting-torch holder. 4,333,636, Cl. 266-68.000.

Wake, Kiyoyasu, to Miwa Lock Co., Ltd. Magnetic tumbler lock. 4,333,327, Cl. 70-276.000.

Walker, William B.: *See—*
Mueller, Wilfred; Ingham, Donald M.; and Walker, William B., 4,333,607, Cl. 239-13.000.

Walraet, Jean G.: *See—*
Bertin, Marcel R.; Boutmy, Patrick E.; Le Fort, Gilbert J.; and Walraet, Jean G., 4,334,303, Cl. 370-13.000.

Walsh, David A., to A. H. Robins Company, Inc. 2-Amino-6-biphenylacetic acids. 4,333,951, Cl. 424-319.000.

Walsh, John S.: *See—*
Buhs, Rudolf P.; Jacob, Theodore A.; Miwa, Gerald; Sestokas, Elena; Taub, Rae; and Walsh, John S., 4,333,925, Cl. 424-181.000.

Walther, Gerhard. Aquaria inlet means. 4,333,829, Cl. 210-169.000.

Wang, David N.: *See—*
Lifshitz, Nadia; Moran, Joseph M.; and Wang, David N., 4,333,793, Cl. 156-643.000.

Wang, Hsian. Multi-function closet stool. 4,333,184, Cl. 4-313.000.

Ward, James C., to Ward Outdoor Advertising. Advertising display apparatus. 4,333,255, Cl. 40-524.000.

Ward Outdoor Advertising: *See—*
Ward, James C., 4,333,255, Cl. 40-524.000.

Warfel, David R.: *See—*
Blommers, Elizabeth A.; Warfel, David R.; and Ingram, Alvin R., 4,333,970, Cl. 427-222.000.

Warner-Lambert Company: *See—*
Okajima, Yakutaro; and Sekigawa, Keiji, 4,333,957, Cl. 426-140.000.

Warren, Barbara K., to Union Carbide Corporation. Catalyst for the selective production of ethanol and methanol directly from synthesis gas. 4,333,852, Cl. 252-429.00R.

Wasik, Janice E.: *See—*
Wasik, Ronald J.; and Wasik, Janice E., 4,333,241, Cl. 33-174.00T.

Wasik, Ronald J.; and Wasik, Janice E. Pasta measurer. 4,333,241, Cl. 33-174.00T.

Watanabe, Isao: *See—*
Komurasaki, Satoshi; Watanabe, Isao; and Ito, Osamu, 4,334,299, Cl. 369-44.000.

Watanabe, Kenkichi, to Tokyo. Coin wrapping machine. 4,333,296, Cl. 53-64.000.

Watanabe, Masatoshi: *See—*
Ooki, Norihiro; Motegi, Shoji; and Watanabe, Masatoshi, 4,334,159, Cl. 310-54.000.

Watanabe, Masayoshi: *See—*
Ohata, Katsuya; Nomura, Tadatoshi; and Watanabe, Masayoshi, 4,333,926, Cl. 424-182.000.

Watanabe, Thuyoshi: *See—*
Abe, Koichi; Ishihara, Masami; and Watanabe, Thuyoshi, 4,334,080, Cl. 560-99.000.

Watari, Kazuhiro: *See—*
Hashimoto, Katsuhiko; Nambu, Hirohiko; Watari, Kazuhiro; Mizuno, Kenichi; Murakami, Tadateru; Matsuoka, Yutaka; Moriyama, Mitsutoshi; and Ohno, Norio, 4,334,108, Cl. 568-803.000.

Waters Associates, Inc.: *See—*
Abrahams, Louis; and Izod, Thomas P. J., 4,333,977, Cl. 428-131.000.

Watkins, Bruce J., to Hughes Tool Company. Annulus valve. 4,333,526, Cl. 166-87.000.

Watt, Gordon J., to Kollmorgen Technologies Corporation. Method and apparatus for generating aspherical surfaces of revolution. 4,333,368, Cl. 82-1.00C.

Waugh, Richard A.: *See—*
Billings, David L.; Fey, Robert M.; and Waugh, Richard A., 4,333,322, Cl. 68-23.200.

Weatherley, Laurence R.: *See—*
Mills, Alfred L.; Weatherley, Laurence R.; and Crofts, John A., 4,333,912, Cl. 423-20.000.

Weaver, Frederick D.: *See—*
Pack, Gary D.; and Weaver, Frederick D., 4,333,849, Cl. 252-316.000.

Weaver, William J.: *See—*
Montgomery, Francis E.; Short, James E., Jr.; and Weaver, William J., 4,333,737, Cl. 23-297.000.

Webb, William G., to Sterling Drug Inc. Self-aspirating hypodermic syringe and self-aspirating assembly therefor. 4,333,456, Cl. 128-218.00R.

Webb, William G.: *See—*
Margulies, Herman; and Webb, William G., 4,333,458, Cl. 128-218.00R.

Weber, Karl-Heinz; Langbein, Adolf; Lehr, Erich; Boke, Karin; and Kuhn, Franz J., to Boehringer Ingelheim GmbH. 8-Halo-6-phenyl-4H-s-triazolo (3,4-c) thieno 1,4-diazepin-1-ones. 4,333,944, Cl. 424-269.000.

Weber, Waldemar: *See—*
Dorr, Karl H.; Diekmann, Helmut; Grimm, Hugo; Sander, Ulrich; Tacke, Michael; and Weber, Waldemar, 4,333,917, Cl. 423-522.000.

Weinar, Roger N. Walls and partitions and concealed fasteners for assembly thereof. 4,333,286, Cl. 52-281.000.

Weis, Gerald J.: *See—*
Munoz, Donald L.; Grote, Daniel A.; Bronder, David G.; and Weis, Gerald J., 4,333,678, Cl. 296-39.00R.

Weisman, Roland E., to International Harvester Co. Automatic bucket leveler. 4,333,251, Cl. 37-118.00R.

Weissmueller, William R., to Zenith Radio Corporation. Sawtooth waveform generation for a television receiver. 4,334,174, Cl. 315-408.000.

Weithmann, Klaus U., to Hoechst Aktiengesellschaft. Pharmaceutical formulations containing prostaglandin. 4,333,948, Cl. 424-285.000.

Weldin, Karl D., to Epps, Jerre E., a part interest. Cassette tape dust cover. 4,333,568, Cl. 206-387.000.

Welebir, Andrew J. 1-Triacontanol plant growth stimulator formulations. 4,333,758, Cl. 71-80.000.

Welly, Jurgen-Dietrich: *See—*
Gebel, Rudolf; Peche, Gerhard; Schindler, Heinrich; and Welly, Jurgen-Dietrich, 4,334,133, Cl. 200-279.000.

Welter, Thomas N. H.: *See—*
Schmit, Georges J. E.; and Welter, Thomas N. H., 4,333,507, Cl. 152-359.000.

Wentworth, Alan W. Method of repairing a box beam. 4,333,218, Cl. 29-402.160.

Werner, Brandin, to Trailigaz, Compagnie Generale de l'Ozone. Device for dispersing a fluid in a liquid and in particular ozonized air in water. 4,333,834, Cl. 210-219.000.

Wertz, David H.: *See—*
Wu, Tse C.; Prevorsek, Dusan C.; and Wertz, David H., 4,334,045, Cl. 525-439.000.

West, Joe E. Liquid inertia tool. 4,333,492, Cl. 137-119.000.

West, Laurice J. Method of image enhancement. 4,333,707, Cl. 350-144.000.

Western Electric Company, Inc.: *See—*
Kuyel, Birol, 4,333,814, Cl. 204-298.000.
Meal, John R.; and Sandmore, Donald K., 4,333,213, Cl. 29-25.420.
Neumann, Harry C.; and Skiba, Frank G., 4,333,214, Cl. 29-80.000.

Western Geophysical Co. of America: *See—*
Hall, Ernest M., Jr., 4,334,296, Cl. 367-180.000.

Westinghouse Electric Corp.: *See—*
Merbach, Paul C., 4,334,266, Cl. 364-167.000.
Schroeder, Dale W., 4,334,181, Cl. 318-762.000.
Uram, Robert, 4,333,310, Cl. 60-39.18B.

WetCom Engineering Ltd.: *See—*
McCorquodale, Robert P., 4,333,529, Cl. 166-267.000.

Weyerhaeuser Company: *See—*
Blickenderfer, Charles, 4,333,373, Cl. 83-419.000.

Whalen, George J.: *See—*
Rosenhagen, William; and Whalen, George J., 4,334,221, Cl. 340-825.720.

Wheelabrator-Frye Inc.: *See—*
Schulte, Harold F.; Leliaert, Raymond M.; and Rohr, Robert D., 4,333,278, Cl. 51-434.000.

White, Albert O.: *See—*
Lyons, William C.; and White, Albert O., 4,333,539, Cl. 175-61.000.

White, Dwain M., to General Electric Company. Arene polysulfonyl halide coupled block polymers of polyphenylene oxide and aromatic polyformals. 4,334,050, Cl. 525-390.000.

White, Jonathan C.: *See—*
Freeman, Richard R.; and White, Jonathan C., 4,334,200, Cl. 372-90.000.

Whitehouse, David J., to Rank Organisation Limited, The. Testing apparatus. 4,334,282, Cl. 364-728.000.

Whitehouse, Harper J.: *See—*
Bond, James W.; and Whitehouse, Harper J., 4,334,277, Cl. 364-703.000.

Wickham, Geoffrey G.: *See—*
Jeffcoat, Keith W.; and Wickham, Geoffrey G., 4,333,469, Cl. 128-419.00F.

Wiebush, LeMoey M.: *See—*
Parman, Dan F.; Wiebush, LeMoey M.; Shaw, Fred M.; and Cummins, James P., 4,334,171, Cl. 315-199.000.

Wiechert, Rudolf: *See—*
Neef, Gunter; Eder, Ulrich; Haffer, Gregor; Sauer, Gerhard; Wiechert, Rudolf; and Steinbeck, Hermann, 4,333,928, Cl. 424-243.000.

Wiedenman, Gregory B.; and Marsh, Phillip W., to Sperry Rand Corporation. Buffer memory arrangement. 4,334,287, Cl. 364-900.000.

Wiedman, Francis W.: *See—*
Bhattacharyya, Arup; Chu, Wei-Kan; Howard, James K.; and Wiedman, Francis W., 4,333,808, Cl. 204-192.00D.

Wiedmann, Siegfried K.: *See—*
Heuber, Klaus; and Wiedmann, Siegfried K., 4,334,294, Cl. 365-203.000.

Wiegner, Georg. Hygienic sanitary towel. 4,333,465, Cl. 128-290.00R.

Wild, Gene M.: *See—*
Baltz, Richard H.; Wild, Gene M.; and Seno, Eugene T., 4,334,019, Cl. 435-76.000.

Wilder, Arthur H.: *See—*
Lemrow, Craig M.; and Wilder, Arthur H., 4,333,447, Cl. 126-443.000.

Wilgood Corporation: *See—*
Feller, Murray F., 4,333,354, Cl. 73-861.770.

Wilkinson, Nicholas P.: *See—*
Speakman, John G.; and Wilkinson, Nicholas P., 4,333,851, Cl. 252-429.00B.

Wilkinson, Noel R.: *See—*
Hancock, John C.; Winwood, John M.; and Wilkinson, Noel R., 4,333,393, Cl. 99-277.200.

Wilkinson, William H.; and Hanna, William T., to Battelle Development Corp. Process and system for boosting the temperature of sensible waste heat sources. 4,333,515, Cl. 165-1.000.

Willett, John T.: *See—*
Kaplan, Howard I.; Bryce, Jerry H.; Johnston, Thomas J.; McMinn, Curtis J.; Willett, John T.; and Richards, Nolan E., 4,333,813, Cl. 204-243.00R.

Wilson, Carol A.: *See—*
Gates, Peter S.; Baldwin, Derek; Wilson, Carol A.; and Gillon, John, 4,333,759, Cl. 71-88.000.

Wilson, Richard A.: *See—*
Mookherjee, Braja D.; Trenkle, Robert W.; Wilson, Richard A.; Schmitt, Frederick L.; Vock, Manfred H.; Granda, Edward J.; Vinals, Joaquin; Kiwala, Jacob; and Schreiber, William L., 4,334,098, Cl. 568-347.000.

Winey, Donald A.: *See—*
Emmons, William D.; Winey, Donald A.; and Rounds, Nicholas A., 4,333,963, Cl. 427-44.000.

Winfield, Armand G.; and Winfield, Barbara L. Abrasion resistant impact absorbent animal stall floor and wall covering. 4,333,981, Cl. 428-215.000.

Winfield, Barbara L.: *See—*
Winfield, Armand G.; and Winfield, Barbara L., 4,333,981, Cl. 428-215.000.

Wing, Phillip L.; and Sweeney, George A., to Dow Chemical Company, The. Glycol compositions containing a hydrolyzate of an organo phosphorus-silicon compound. 4,333,843, Cl. 252-75.000.

Winter, George R., III, to UOP Inc. Corrosion inhibition in aromatic liquid extraction. 4,333,823, Cl. 208-325.000.

Winters, Robert E. Brake and clutch lock assembly. 4,333,326, Cl. 70-203.000.

Winwood, John M.: *See—*
Hancock, John C.; Winwood, John M.; and Wilkinson, Noel R., 4,333,393, Cl. 99-277.200.

Wirkkala, Ben. Cable connector. 4,333,675, Cl. 294-78.00R.

Wistar Institute of Anatomy and Biology, The: *See—*
Furukawa, Toru, 4,334,016, Cl. 435-5.000.

Witte, Earl R., to Meridian Industries Inc. Protective sleeve for plants. 4,333,267, Cl. 47-84.000.

Wittekoek, Stefan; and Fahner, Theodorus A., to U.S. Philips Corporation. Apparatus for writing patterns in a layer on a substrate by means of a beam of electrically charged particles. 4,334,139, Cl. 219-121.0EW.

Wittkamp, Reinrich: *See—*
Nagel, Peter; Schoettle, Klaus; Wittkamp, Reinrich; and Hauck, Karl, 4,333,418, Cl. 118-106.000.
Wolcott, Duane K.; and Carraway, John B., Jr., to Dow Chemical Company, The. Analyzer for chemical oxidizing or reducing agents. 4,333,810, Cl. 204-195.00M.
Wolf, Ernest; and Amos, John, to Sky-Top Sunroofs Ltd. Vehicle sunroof installation. 4,333,680, Cl. 296-216.000.
Wolf, George: *See—*
Plotkin, George M.; and Wolf, George, 4,334,017, Cl. 435-7.000.
Wolf, Horst: *See—*
Krass, Ekkehard; and Wolf, Horst, 4,334,089, Cl. 562-463.000.
Wolf, Ronald J., to Wabash, Inc. Capacitor discharge ignition system and method of manufacture thereof. 4,333,442, Cl. 123-599.000.
Wollard Aircraft Equipment, Inc.: *See—*
Drozd, Otto, 4,333,194, Cl. 14-71.500.
Wong, Joseph. Collapsible hanger device. 4,333,575, Cl. 211-118.000.
Wong, Wilson T. C., to Sperry Corporation. Multiplier decoding using parallel MQ register. 4,334,284, Cl. 364-748.000.
Woodman, Daniel C., to Hughes Tool Company. Seal assembly releasing tool. 4,333,528, Cl. 166-117.500.
Woods, Larry N. Anti-static package for electronic chips. 4,333,565, Cl. 206-329.000.
Woods, Lee O.: *See—*
Haag, Donald L.; and Woods, Lee O., 4,334,162, Cl. 310-68.00C.
Woodward, James C.; and Holland, Marion D., to Robbins, Robert E. Vacuum cleaner with soil agitator and compressed air means. 4,333,205, Cl. 15-345.000.
Wright, Fred R. Electronic latch for digitally actuating a load. 4,334,212, Cl. 340-347.0DA.
Wright, Harold A.; and Ingram, Alvin R., to Atlantic Richfield Company. Process for producing styrenic polymer beads of preferred bead size. 4,333,969, Cl. 427-222.000.
Wright, James A.: *See—*
Guzay, Casimir M.; and Wright, James A., 4,333,633, Cl. 251-320.000.
Wu, Hann C., to Horng Meei Spring Enterprise Co. Ltd. Exercising apparatus with gas resistance. 4,333,645, Cl. 272-130.000.
Wu, Tse C.; Prevorsek, Dusan C.; and Wertz, David H., to Allied Corporation. Low color compositions comprising a cross-linked polycyanurate polymer and a thermoplastic polymer. 4,334,045, Cl. 525-439.000.
Wuerz, Albrecht: *See—*
Ruettiger, Wilhelm; Suetsch, Franz; and Wuerz, Albrecht, 4,333,190, Cl. 8-151.000.
Wyland, Donald J.; and Stowe, Michael W., to Industrial Magnetics, Inc. Dump pit magnet assembly. 4,333,825, Cl. 209-223.00A.
Wyner, Elliott F.; Burr, Orville R.; and Garrison, Robert L., to GTE Products Corporation. Adaptor for high intensity arc discharge lamps. 4,334,172, Cl. 315-289.000.
Xerox Corporation: *See—*
Green, Frederick A.; Simpson, George R.; Avery, Stephen T.; and Durbin, John A., 4,333,723, Cl. 355-71.000.
Saran, Amitabh, 4,334,246, Cl. 358-261.000.
Yeh, Keming W., 4,333,225, Cl. 29-571.000.
Xomox Corporation: *See—*
Smith, Russell G., 4,333,632, Cl. 251-214.000.
Yagi Antenna Co., Ltd.: *See—*
Satou, Shun; and Jitsumatsu, Yuuji, 4,334,214, Cl. 340-552.000.
Yahagi Iron Co., Ltd.: *See—*
Sugiura, Taku; Fukuoka, Katsuya; Inoue, Tomihiko; Kanbe, Masayoshi; and Iwama, Toshio, 4,333,512, Cl. 164-453.000.
Yahner, Joseph A.: *See—*
Beck, James R.; and Yahner, Joseph A., 4,333,923, Cl. 424-115.000.
Yajima, Seishi; Okamura, Kiyohito; and Shishido, Toetsu, to Yajima, Seishi. Heat resistant polyvanadiosiloxanes and a process for their production. 4,334,051, Cl. 528-25.000.
Yamada, Yasuyuki; Masuyama, Kenichi; and Kitamoto, Tatsuji, to Fuji Photo Film Co., Ltd. Magnetic recording media. 4,333,988, Cl. 428-425.900.
Yamaga, Eiichi: *See—*
Okumura, Takatoshi; Nakada, Akira; Uchiyama, Yasuji; Aoki, Eiichiro; Yamaga, Eiichi; and Oya, Akiyoshi, 4,333,374, Cl. 84-1.010.
Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Iio, Toshimitsu; and Yamaoka, Yuusaku, 4,333,431, Cl. 123-323.000.
Yamane, Ichiro: *See—*
Nakazawa, Hidetsugu; Yamane, Ichiro; and Akutsu, Eiichi, 4,334,020, Cl. 435-110.000.
Yamano, Masaru; and Kuwano, Yukinori, to Sanyo Electric Co., Ltd. Sunlight-into-energy conversion apparatus. 4,334,120, Cl. 136-248.000.
Yamaoka, Yuusaku: *See—*
Iio, Toshimitsu; and Yamaoka, Yuusaku, 4,333,431, Cl. 123-323.000.
Yamashita, Fumio; and Kurobe, Hideharu, to Kanai, Hiroyuki. Steel cord. 4,333,306, Cl. 57-206.000.
Yamato, Noboru; and Satake, Tosimi, to Jujo Patper Co., Ltd. Heat-sensitive recording paper. 4,333,990, Cl. 428-531.000.
Yamato Refractives & Co.: *See—*
Naito, Hiroyuki; Maruya, Takashi; Gotoh, Kyugo; and Ohmori, Hideyo, 4,334,029, Cl. 501-109.000.
Yamazaki, Etsuo: *See—*
Imazeki, Ryoji; and Yamazaki, Etsuo, 4,334,272, Cl. 364-474.000.
Imazeki, Ryoji; Yamazaki, Etsuo; and Sasaki, Takao, 4,334,281, Cl. 364-723.000.
Yanadori, Michio; Hasegawa, Kengo; and Uchida, Motokazu, to Hitachi, Ltd. Heating and cooling ventilating system with heat recovery. 4,333,520, Cl. 165-59.000.
Yanai, Akio: *See—*
Shirahata, Ryuji; Yanai, Akio; and Kitamoto, Tatsuji, 4,333,985, Cl. 428-336.000.
Yang, Chiu H.; and Hong, Zuu C. Apparatus for rapidly and continuously defoaming liquid material. 4,333,747, Cl. 55-178.000.
Yarian, Dean R., to Minnesota Mining and Manufacturing Company. Imaging compositions. 4,334,015, Cl. 435-1.000.
Yatsushiro, Kenji; and Kuchuris, George F., to Singer Company, The. Multi-speed permanent magnet motor. 4,334,164, Cl. 310-114.000.
Yazu, Shuji: *See—*
Tsuji, Kazuo; Yazu, Shuji; and Hara, Akio, 4,333,986, Cl. 428-402.000.
Yeargin, Homer E. Wire release tool. 4,333,231, Cl. 29-764.000.
Yeh, Keming W., to Xerox Corporation. Method of making a circular high voltage field effect transistor. 4,333,225, Cl. 29-571.000.
Yokota, Yukio: *See—*
Aoki, Kozo; Seoka, Yoshio; and Yokota, Yukio, 4,334,011, Cl. 430-552.000.
Yokoyama, Eiichi, to Sony Corporation. Apparatus for use in recording a pulse signal on a magnetic recording medium. 4,334,249, Cl. 360-30.000.
Yonezawa, Kazuya; Furukawa, Hisao; and Azuma, Masaaki, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for producing curable vinyl polymer having silyl group. 4,334,036, Cl. 525-102.000.
Yonkers, Robert A., to Bissell, Inc. Conversion attachment for a wet-dry vacuum cleaner. 4,333,203, Cl. 15-321.000.
Yoshida, Hiroshi; Hagiwara, Isao; and Oodera, Shigeyuki, to Yoshida Kogyo K.K. Row of continuous slide fastener coupling elements and method of making the same. 4,333,903, Cl. 264-165.000.
Yoshida Kogyo K.K.: *See—*
Ebata, Hiroyuki, 4,333,283, Cl. 52-202.000.
Yoshida, Hiroshi; Hagiwara, Isao; and Oodera, Shigeyuki, 4,333,903, Cl. 264-165.000.
Yoshida, Syozo; and Sugiura, Yoji, to Canon Kabushiki Kaisha. Electromagnetically driven shutter. 4,333,721, Cl. 354-234.000.
Yoshida, Yasuharu, to Nippon Electric Co., Ltd. Phase synchronizing circuit for use in multi-level, multi-phase, superposition-modulated signal transmission system. 4,334,312, Cl. 375-20.000.
Yoshimura, Noriaki; and Tamura, Masuhiko, to Kuraray Co., Ltd. Process for producing alkadienes. 4,334,117, Cl. 585-509.000.
Young, Gerald T.; Easterling, Michael R.; and Dukeshire, Robert E., to Goodyear Tire & Rubber Company, The. Molding articles of thermoplastic rubber. 4,333,901, Cl. 264-85.000.
Young, Robert N.: *See—*
Belanger, Patrice C.; Rokach, Joshua; Young, Robert N.; and Scheigetz, John, 4,334,077, Cl. 549-12.000.
Young, Rodney C.: *See—*
Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., 4,333,946, Cl. 424-273.00R.
Yundt, Albert P.: *See—*
Rice, John F.; Yundt, Albert P.; and Quast, Kenneth J., 4,334,008, Cl. 430-270.000.
Zahnradfabrik Friedrichshafen: *See—*
Beig, Willy, 4,334,130, Cl. 200-61.540.
Zahra, Frank G.; and Binder, Johann V. Weeder for row crops. 4,333,533, Cl. 172-155.000.
Zaidan Hojin Handotai Kenkyu Shinkokai: *See—*
Nishizawa, Jun-ichi, 4,334,235, Cl. 357-23.000.
Zajac, David: *See—*
Luedicke, Oscar B.; Domzalski, Thad; and Zajac, David, 4,333,921, Cl. 424-70.000.
Zann, Annie: *See—*
Dubois, Jean-Claude; Zann, Annie; Billard, Jean; and Hareng, Michel, 4,333,709, Cl. 350-350.00R.
Zanobi, Antonio: *See—*
Mantovani, Elvio; Palladino, Nicola; and Zanobi, Antonio, 4,334,101, Cl. 568-454.000.
Zapfel, Horst: *See—*
Schindlmayr, Peter; and Zapfel, Horst, 4,333,731, Cl. 8-436.000.
Zeanwick, Ernest J., to Textron, Inc. Workbench filtering station and method. 4,333,745, Cl. 55-97.000.
Zemelman, Valery B.; Kleiner, Fredric; and Kuchman, Michael J., to General Foods Corporation. Process for preparing a gasified ice product. 4,333,315, Cl. 62-1.000.
Zenith Radio Corporation: *See—*
Gabriel, Melvin E.; and Van Baalen, Joseph M., 4,334,173, Cl. 315-399.000.
Moore, Frederic J., 4,334,323, Cl. 455-179.000.
Rockwell, Robert G., 4,334,170, Cl. 315-16.000.
Srivastava, Gopal K., 4,334,243, Cl. 358-153.000.
Weissmueller, William R., 4,334,174, Cl. 315-408.000.
Zenmi Co., Ltd.: *See—*
Nakano, Tadao, 4,333,464, Cl. 128-290.00R.
Zero-Max Industries, Incorporated: *See—*
Landino, Paul J., 4,334,182, Cl. 318-808.000.
Ziering, Albert: *See—*
Berger, Leo; Plati, John T.; and Ziering, Albert, 4,334,078, Cl. 549-43.000.
Ziesche, Kurt: *See—*
Kopse, Odon; and Ziesche, Kurt, 4,333,436, Cl. 123-502.000.
Zimmerman, William T., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,333,760, Cl. 71-92.000.

Zine, Anthony R., Jr.: *See*—
Hertl, William; and Zine, Anthony R., Jr., 4,333,564, Cl. 206-216.000.
Zipp, Otmar: *See*—
Metzinger, Lothar; Zipp, Otmar; and Bollmann, Heinz, 4,334,033, Cl. 521-159.000.
Zoecon Corporation: *See*—
Baer, Ted A.; and Labovitz, Jeffrey N., 4,334,087, Cl. 562-459.000.
Zucker, Friedrich J.; Osthaus, Georg; and Zucker-Kerbler, Doris, to Zucker, Friedrich Josef. Process for decomposing cells of biomasses or the like. 4,333,611, Cl. 241-1.000.
Zucker, Friedrich Josef: *See*—
Zucker, Friedrich J.; Osthaus, Georg; and Zucker-Kerbler, Doris, 4,333,611, Cl. 241-1.000.
Zucker-Kerbler, Doris: *See*—
Zucker, Friedrich J.; Osthaus, Georg; and Zucker-Kerbler, Doris, 4,333,611, Cl. 241-1.000.
Zuckert, Bertram, to Vianova Kunstharz, A.G. Process for producing improved alkyd resin emulsions. 4,333,864, Cl. 525-501.500.
Zuckert, Bertram, to Vianova Kunstharz, A.G. Aqueous emulsion of air drying and stoving alkyd resins and process for producing said resins. 4,333,865, Cl. 523-410.000.
Zukowski, Edward A., to El Paso Polyolefins Company. Two-phase ethylene-propylene block copolymerization process. 4,334,041, Cl. 525-53.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF JUNE, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aktieselskabet Niro Atomizer: *See—*
Moller, Aage; and Straarup, Orla, Re. 30,963, Cl. 239-224.000.

Aladdin Industries, Incorporated: *See—*
Bridges, John A., Re. 30,962, Cl. 220-23.600.

Anderson, John S.; and Anderson, Virginia B. Scheduling board. Re. 30,959, Cl. 40-374.000.

Anderson, Virginia B.: *See—*
Anderson, John S.; and Anderson, Virginia B., Re. 30,959, Cl. 40-374.000.

Bridges, John A., to Aladdin Industries, Incorporated. Insulated trays for food or the like. Re. 30,962, Cl. 220-23.600.

Butner, Dean C.; and Clark, Douglas C., to R. J. Reynolds Tobacco Company. Package inspection and handling system. Re. 30,964, Cl. 209-536.000.

Clark, Douglas C.: *See—*
Butner, Dean C.; and Clark, Douglas C., Re. 30,964, Cl. 209-536.000.

Hitzman, Donald O., to Provesta Corporation. Fermentation of oxygenated hydrocarbon compounds with thermophilic microorganisms and microorganisms therefor. Re. 30,965, Cl. 435-68.000.

Moller, Aage; and Straarup, Orla, to Aktieselskabet Niro Atomizer. Atomizer wheel with wear-resistant, sintered bushings. Re. 30,963, Cl. 239-224.000.

NJM, Inc.: *See—*
White, Rollin T., Re. 30,958, Cl. 40-310.000.

Provesta Corporation: *See—*
Hitzman, Donald O., Re. 30,965, Cl. 435-68.000.

R. J. Reynolds Tobacco Company: *See—*
Butner, Dean C.; and Clark, Douglas C., Re. 30,964, Cl. 209-536.000.

Robbins, Roland W. Solar-energy-powered sun tracker. Re. 30,961, Cl. 126-425.000.

Sommer, Warren T. Central receiver solar collector using mechanically linked mirrors. Re. 30,960, Cl. 126-424.000.

Straarup, Orla: *See—*
Moller, Aage; and Straarup, Orla, Re. 30,963, Cl. 239-224.000.

White, Rollin T., to NJM, Inc. Package label and manufacture of same. Re. 30,958, Cl. 40-310.000.

LIST OF DESIGN PATENTEES

A & H Mfg. Co.: *See—*
Feibelman, Jeffrey A., 264,820, Cl. D9-457.000.

Aitkens, Dunbar C. Game board. 264,857, 6-8-82, Cl. D21-16.000.

American Commercial Inc.: *See—*
Blake, Alfred, 264,793, Cl. D7-18.000.

Anchor Hocking Corporation: *See—*
O'Toole, David M., 264,812, Cl. D9-385.000.
Potter, Jerald E., 264,813, Cl. D9-385.000.

Annand, George. Gripping and holding device. 264,805, 6-8-82, Cl. D8-107.000.

Augustsson, Nils E.; Westerlund, Kjell B.; and Stahl, Kay W., to Instrument AB Therados. Treatment couch top. 264,874, 6-8-82, Cl. D24-3.000.

Austin, John J., to Champion International Corporation. Sleeve blank for connecting containers. 264,817, 6-8-82, Cl. D9-433.000.

Azzalin, Ernesto. Console. 264,781, 6-8-82, Cl. D6-85.000.

Baker, Richard E. Used syringe receptacle. 264,879, 6-8-82, Cl. D24-31.000.

Barker, Roderick L. Mouse trap. 264,867, 6-8-82, Cl. D22-18.000.

Baumgartner, Albert, to SFS Stadler AG. Screw. 264,807, 6-8-82, Cl. D8-387.000.

Bausch & Lomb Incorporated: *See—*
Huckenbeck, Claus O., 264,851, Cl. D16-134.000.

Bean Station Furniture Factory, The: *See—*
Friedman, Alan H., 264,776, Cl. D6-63.000.

Beavers, James C. Fishing lure. 264,868, 6-8-82, Cl. D22-27.000.

Benchmark Tool Company: *See—*
Irelan, Edward A., 264,849, Cl. D15-132.000.

Berkman, Joseph L. Video-tape case with removable partitions. 264,771, 6-8-82, Cl. D3-35.000.

Billings, Zeb: *See—*
Faas, Chuck; and Billings, Zeb, 264,786, Cl. D6-184.000.

Blake, Alfred, to American Commercial Inc. Tureen. 264,793, 6-8-82, Cl. D7-18.000.

Blanchard, Gaynor J. Auxiliary seat for a child. 264,788, 6-8-82, Cl. D6-201.000.

Brandt, Inc., Currency Systems Division: *See—*
DiBlasio, John, 264,847, Cl. D14-110.000.

Bridges, Peggy J.: *See—*
Fritz, Ann K.; and Bridges, Peggy J., 264,794, Cl. D7-41.000.

Broyhill Furniture Industries, Inc.: *See—*
Smith, Melbourne F., Jr., 264,785, Cl. D6-154.000.

Burgeson, Oscar B.; and Phelps, Richard W., to Stanley Works, The. Screw holding clip for screw drivers. 264,808, 6-8-82, Cl. D8-395.000.

Burglin, Robert E.; and Itaya, Sam S. Automobile cleaning and waxing tool. 264,797, 6-8-82, Cl. D8-62.000.

Burnett, George E. Dispensing cap. 264,819, 6-8-82, Cl. D9-449.000.

Burnstein, Philip J.: *See—*
Conforti, Frederick J.; Burnstein, Philip J.; and Fenne, Kenneth R., 264,826, Cl. D10-106.000.

C. Joseph Lamy GmbH: *See—*
Spiegel, Bernt, 264,854, Cl. D19-49.000.

Carlan Trading Ltd.: *See—*
Goodman, Steven, 264,872, Cl. D23-146.000.

Champion International Corporation: *See—*
Austin, John J., 264,817, Cl. D9-433.000.

Chou, Albert S.: *See—*
Daniels, Donald V.; West, Terence H.; and Chou, Albert S., 264,842, Cl. D14-109.000.

Christian Dior, S.A.: *See—*
Spreter, Pierre, 264,767, Cl. D2-427.000.

Clar, Frederick S. Alignment attachment for a golf putter. 264,866, 6-8-82, Cl. D21-221.000.

Clorox Company, The: *See—*
Weckman, Richard L., 264,811, Cl. D9-375.000.

Conforti, Frederick J.; Burnstein, Philip J.; and Fenne, Kenneth R., to Pittway Corporation. Security system console. 264,826, 6-8-82, Cl. D10-106.000.

Conti, Rino, to Dart Industries Inc. Combined food storage and service dish. 264,791, 6-8-82, Cl. D7-1.000.

Conti, Rino, to Dart Industries Inc. Combined food storage and service dish. 264,792, 6-8-82, Cl. D7-1.000.

Cordis Dow Corp.: *See—*
Landau, Julian I., 264,878, Cl. D24-21.000.

Crocker, Joseph T., to Surgical Engineering Co., Inc. Combined surgical headrest and wrist rest. 264,875, 6-8-82, Cl. D24-7.000.

Cunningham, Louise B. Ring guard. 264,827, 6-8-82, Cl. D11-34.000.

Daniels, Donald V.; West, Terence H.; and Chou, Albert S., to Xerox Corporation. Fixed disk drive. 264,842, 6-8-82, Cl. D14-109.000.

Dart Industries Inc.: *See—*
Conti, Rino, 264,791, Cl. D7-1.000.
Conti, Rino, 264,792, Cl. D7-1.000.
Fritz, Ann K.; and Bridges, Peggy J., 264,794, Cl. D7-41.000.

Dennis, Terry J. Puzzle. 264,858, 6-8-82, Cl. D21-107.000.

DiBlasio, John, to Brandt, Inc., Currency Systems Division. Document handling and counting device. 264,847, 6-8-82, Cl. D14-110.000.

Dieter, Norman H., Jr.: *See—*
Drelinger, Sanford; Dieter, Norman H., Jr.; and Padron, Lazzaro, 264,816, Cl. D9-424.000.

Dinand, Pierre, to Yardley of London, Inc. Bottle. 264,814, 6-8-82, Cl. D9-389.000.

Dock, Mortimer R.: *See—*
Kamel, Medhat M.; and Dock, Mortimer R., 264,790, Cl. D6-271.000.

Dornier, Peter. Aircraft. 264,837, 6-8-82, Cl. D12-324.000.
Dornier, Peter. Aircraft. 264,838, 6-8-82, Cl. D12-324.000.
Drelinger, Sanford; Dieter, Norman H., Jr.; and Padron, Lazzaro, to Micro-Acoustics Corporation. Phonograph cartridge box. 264,816, 6-8-82, Cl. D9-424.000.
Dulisse, Eugene. Camper unit for a pick-up truck. 264,831, 6-8-82, Cl. D12-156.000.
Dunlap, Guy L. Clock. 264,822, 6-8-82, Cl. D10-10.000.
Eastman Kodak Company: *See—*
Olson, Richard J.; and Hood, Lawrence E., 264,873, Cl. D24-1.100.
Faas, Chuck; and Billings, Zeb, to Sight & Sound International, Inc. Literature holder. 264,786, 6-8-82, Cl. D6-184.000.
Fallen, Floyd F.; and Wilson, Calvin L., to Reynolds Metals Company. Carton blank. 264,818, 6-8-82, Cl. D9-433.000.
Feibelman, Jeffrey A., to A & H Mfg. Co. Jewelry display card. 264,820, 6-8-82, Cl. D9-457.000.
Feldman, Fred. Loud speaker cabinet. 264,840, 6-8-82, Cl. D14-31.000.
Feldman, Louis. Interlocking reinforced brick. 264,886, 6-8-82, Cl. D25-87.000.
Fenne, Kenneth R.: *See—*
Conforti, Frederick J.; Burnstein, Philip J.; and Fenne, Kenneth R., 264,826, Cl. D10-106.000.
Frick, Steven E.; and Merritt, Douglas R. Wrench. 264,796, 6-8-82, Cl. D8-17.000.
Friedman, Alan H., to Bean Station Furniture Factory, The. Seat. 264,776, 6-8-82, Cl. D6-63.000.
Fritz, Ann K.; and Bridges, Peggy J., to Dart Industries Inc. Pastry sheet or the like. 264,794, 6-8-82, Cl. D7-41.000.
Gageby, Steven D. Chair. 264,777, 6-8-82, Cl. D6-78.000.
Gageby, Steven D. Chair. 264,778, 6-8-82, Cl. D6-78.000.
Goodman, Steven, to Carlan Trading Ltd. Design for humidifier or the like. 264,872, 6-8-82, Cl. D23-145.000.
Gordon, Dolores L. Incense holder. 264,869, 6-8-82, Cl. D23-78.000.
Gray, Ernest F. Jewelry clasp. 264,828, 6-8-82, Cl. D11-87.000.
Gustafsson, Lars-Olof: *See—*
Lind, Kaj; and Gustafsson, Lars-Olof, 264,832, Cl. D12-157.000.
Hahn, Victor H. Putter head. 264,864, 6-8-82, Cl. D21-218.000.
Hall, Peter J., to Kibbutz Sheluchot. Microfiche reader. 264,850, 6-8-82, Cl. D16-11.000.
Halstead, Christopher, to Main Gas Appliances Limited. Gas burner. 264,871, 6-8-82, Cl. D23-129.000.
Hanyu, Susumu, to Janome Sewing Machine Co., Ltd. Sewing machine foot pedal. 264,848, 6-8-82, Cl. D15-72.000.
Hattori, Ruth A. Women's jean. 264,765, 6-8-82, Cl. D2-28.000.
Hellwig, John A., to Northern Telecom Limited. Housing for telecommunications apparatus. 264,845, 6-8-82, Cl. D14-68.000.
Henkels, Walter. Combined clock and desk holder for note paper and writing instruments. 264,821, 6-8-82, Cl. D10-2.000.
Hood, Lawrence E.: *See—*
Olson, Richard J.; and Hood, Lawrence E., 264,873, Cl. D24-1.100.
Howard Miller Clock Company: *See—*
Satoh, Takeshi, 264,823, Cl. D10-15.000.
Hubbard, Lafayette R.: *See—*
Swanson, Daniel G., 264,877, Cl. D24-17.000.
Huckenbeck, Claus O., to Bausch & Lomb Incorporated. Auxiliary objective lens for a firearm sight. 264,851, 6-8-82, Cl. D16-134.000.
Huff, Philip K. Quick-release connector. 264,766, 6-8-82, Cl. D2-408.000.
Instrument AB Therados: *See—*
Augustsson, Nils E.; Westerlund, Kjell B.; and Stahl, Kay W., 264,874, Cl. D24-3.000.
Inteo Incorporated: *See—*
Tuck, Winfree P., 264,844, Cl. D14-100.000.
International Harvester Company: *See—*
McGirk, James R.; and Skyer, Robert A., 264,774, Cl. D6-48.000.
Irelan, Brad L. Smoking pipe with dual stems. 264,883, 6-8-82, Cl. D27-03.000.
Irelan, Brad L. Smoking pipe with dual stems. 264,884, 6-8-82, Cl. D27-03.000.
Irelan, Brad L. Smoking pipe. 264,885, 6-8-82, Cl. D27-3.000.
Irelan, Edward A., to Benchmark Tool Company. Housing for drill press. 264,849, 6-8-82, Cl. D15-132.000.
Ishiyama, Atsushi, to Yamaha Hatsudoki Kabushiki Kaisha. Snowmobile. 264,830, 6-8-82, Cl. D12-7.000.
Itaya, Sam S.: *See—*
Burglin, Robert E.; and Itaya, Sam S., 264,797, Cl. D8-62.000.
Izaki, Kenzou, to Tokyo Shibaura Denki Kabushiki Kaisha. Wattmeter. 264,825, 6-8-82, Cl. D10-75.000.
Janome Sewing Machine Co., Ltd.: *See—*
Hanyu, Susumu, 264,848, Cl. D15-72.000.
Jermed Limited: *See—*
Thompson, Kevin, 264,882, Cl. D24-99.000.
John J. Madison Co., Inc.: *See—*
Santa-Eulalia Carvajales, Jesus A.; and Santa-Eulalia Carvajales, Javier B., 264,829, Cl. D11-158.000.
Johnson, Juan N. Bar. 264,784, 6-8-82, Cl. D6-144.000.
Johnson, Logan W.: *See—*
Wenger, Jerry A.; Newell, Darrel E.; Urch, Harvey M.; and Johnson, Logan W., 264,779, Cl. D6-78.000.
Jones, Dale A. Wood splitting implement head. 264,798, 6-8-82, Cl. D8-78.000.
Kabushiki Kaisha Bandai Overseas: *See—*
Yamashina, Naoharu, 264,860, Cl. D21-130.000.
Kai Cutlery Center Co., Ltd.: *See—*
Machida, Naoyoshi, 264,803, Cl. D8-99.000.
Machida, Naoyoshi, 264,804, Cl. D8-99.000.
Osada, Hiroshi, 264,799, Cl. D8-99.000.
Osada, Hiroshi, 264,800, Cl. D8-99.000.
Osada, Hiroshi, 264,801, Cl. D8-99.000.
Osada, Hiroshi, 264,802, Cl. D8-99.000.
Kamel, Medhat M.; and Dock, Mortimer R., to T-Star Research, Inc. Place mat. 264,790, 6-8-82, Cl. D6-271.000.
Karas, Joseph W.; Pfeifer, Robert F.; and Samson, Robert, to Motorola Inc. Multiple module serial link encryption unit or similar article. 264,843, 6-8-82, Cl. D14-100.000.
Kelsey-Hayes Co.: *See—*
Main, John A., 264,834, Cl. D12-210.000.
Main, John A.; and Shinoda, Lawrence K., 264,836, Cl. D12-211.000.
Reid, Donald J., 264,835, Cl. D12-211.000.
Kibbutz Sheluchot: *See—*
Hall, Peter J., 264,850, Cl. D16-11.000.
Kiddie Products Inc.: *See—*
Panicci, Richard L., 264,880, Cl. D24-46.000.
Kokoska, Vera. Exerciser for attachment to door or the like. 264,862, 6-8-82, Cl. D21-191.000.
Koszegi, George, to Koszegi Leather & Vinyl Products, Inc. Camera bag. 264,769, 6-8-82, Cl. D3-33.000.
Koszegi Leather & Vinyl Products, Inc.: *See—*
Koszegi, George, 264,769, Cl. D3-33.000.
Landau, Julian I., to Cordis Dow Corp. Dialysate delivery machine. 264,878, 6-8-82, Cl. D24-21.000.
Lincoln, John H. Combined display hanger and mailing package or similar article. 264,815, 6-8-82, Cl. D9-415.000.
Lind, Kaj; and Gustafsson, Lars-Olof. Container, especially for transporting skis on the roof of a car. 264,832, 6-8-82, Cl. D12-157.000.
Long, Jerry M. Video cassette storage container. 264,770, 6-8-82, Cl. D3-35.000.
Machida, Naoyoshi, to Kai Cutlery Center Co., Ltd. Cutter knife. 264,803, 6-8-82, Cl. D8-99.000.
Machida, Naoyoshi, to Kai Cutlery Center Co., Ltd. Cutter knife. 264,804, 6-8-82, Cl. D8-99.000.
Main Gas Appliances Limited: *See—*
Halstead, Christopher, 264,871, Cl. D23-129.000.
Main, John A., to Kelsey-Hayes Co. Vehicle wheel. 264,834, 6-8-82, Cl. D12-210.000.
Main, John A.; and Shinoda, Lawrence K., to Kelsey-Hayes Co. Vehicle wheel. 264,836, 6-8-82, Cl. D12-211.000.
Maloney, William J., II, to Quaker Oats Company, The. Toy vehicle. 264,861, 6-8-82, Cl. D21-137.000.
Marchisi, Giuseppe: *See—*
Scavino, Mario; and Marchisi, Giuseppe, 264,853, Cl. D19-10.000.
Marlboro Marketing, Inc.: *See—*
Wahl, Michael, 264,783, Cl. D6-139.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Taguchi, Shuhei, 264,846, Cl. D14-94.000.
McCarthy, Richard D. Headboard. 264,780, 6-8-82, Cl. D6-82.000.
McGirk, James R.; and Skyer, Robert A., to International Harvester Company. Tractor seat or similar article. 264,774, 6-8-82, Cl. D6-48.000.
Merritt, Douglas R.: *See—*
Frick, Steven E.; and Merritt, Douglas R., 264,796, Cl. D8-17.000.
Micro-Acoustics Corporation: *See—*
Drelinger, Sanford; Dieter, Norman H., Jr.; and Padron, Lazzaro, 264,816, Cl. D9-424.000.
Morgan, William H., Sr. Golf putter head. 264,865, 6-8-82, Cl. D21-219.000.
Motorola Inc.: *See—*
Karas, Joseph W.; Pfeifer, Robert F.; and Samson, Robert, 264,843, Cl. D14-100.000.
Motsko, James C. Fishing reel pouch. 264,772, 6-8-82, Cl. D3-38.000.
Nemec, John J.: *See—*
Zyla, John F.; and Nemec, John J., 264,789, Cl. D6-254.000.
Newell, Darrel E.: *See—*
Wenger, Jerry A.; Newell, Darrel E.; Urch, Harvey M.; and Johnson, Logan W., 264,779, Cl. D6-78.000.
Northern Telecom Limited: *See—*
Hellwig, John A., 264,845, Cl. D14-68.000.
Nottingham, John R.; and Spirk, John W., Jr. Kaleidoscope. 264,856, 6-8-82, Cl. D21-60.000.
Nozel, Richard J.: *See—*
Trombley, Ulric W.; and Nozel, Richard J., 264,833, Cl. D12-190.000.
Ohkado, Tetsuo, to Tomy Kogyo Co., Inc. Toy pinball machine. 264,855, 6-8-82, Cl. D21-10.000.
Ojve, Jan, to Revent Food Machinery AB. Combined shipping and storage container or similar article. 264,768, 6-8-82, Cl. D3-30.100.
Olko, Henry. Chair. 264,775, 6-8-82, Cl. D6-57.000.
Olson, Richard J.; and Hood, Lawrence E., to Eastman Kodak Company. Chemical analyzer. 264,873, 6-8-82, Cl. D24-1.100.
Organ Needle Col, Ltd.: *See—*
Takeuchi, Masumi, 264,809, Cl. D9-303.000.
Osada, Hiroshi, to Kai-Cutlery Center Co., Ltd. Cutter knife. 264,799, 6-8-82, Cl. D8-99.000.
Osada, Hiroshi, to Kai-Cutlery Center Co., Ltd. Cutter knife. 264,800, 6-8-82, Cl. D8-99.000.
Osada, Hiroshi, to Kai Cutlery Center Co., Ltd. Cutter knife. 264,801, 6-8-82, Cl. D8-99.000.

Osada, Hiroshi, to Kai Cutlery Center Co., Ltd. Cutter knife. 264,802, 6-8-82, Cl. D8-99.000.

O'Toole, David M., to Anchor Hocking Corporation. Jar or similar article. 264,812, 6-8-82, Cl. D9-385.000.

Padron, Lazzaro: *See—*
Drelinger, Sanford; Dieter, Norman H., Jr.; and Padron, Lazzaro, 264,816, Cl. D9-424.000.

Panicci, Richard L., to Kiddie Products Inc. Teether. 264,880, 6-8-82, Cl. D24-46.000.

Pfeifer, Robert F.: *See—*
Karas, Joseph W.; Pfeifer, Robert F.; and Samson, Robert, 264,843, Cl. D14-100.000.

Phelps, Richard W.: *See—*
Burgeson, Oscar B.; and Phelps, Richard W., 264,808, Cl. D8-395.000.

Pickrel, Charles, to Speakerlab, Inc. Speaker horn. 264,841, 6-8-82, Cl. D14-35.000.

Pittway Corporation: *See—*
Conforti, Frederick J.; Burnstein, Philip J.; and Fenne, Kenneth R., 264,826, Cl. D10-106.000.

Potter, Jerald E., to Anchor Hocking Corporation. Jar or similar article. 264,813, 6-8-82, Cl. D9-385.000.

Quaker Oats Company, The: *See—*
Maloney, William J., II, 264,861, Cl. D21-137.000.

Reid, Donald J., to Kelsey-Hayes Co. Vehicle wheel. 264,835, 6-8-82, Cl. D12-211.000.

Revent Food Machinery AB: *See—*
Ojve, Jan, 264,768, Cl. D3-30.100.

Reynolds Metals Company: *See—*
Fallen, Floyd F.; and Wilson, Calvin L., 264,818, Cl. D9-433.000.

Ross, Charles A.; and Schell, Jerry L. Housing for electronic apparatus. 264,839, 6-8-82, Cl. D13-41.000.

Russel William, Ltd.: *See—*
Savas, Nedim, 264,787, Cl. D6-186.000.

Russell, Walter L. Winder. 264,806, 6-8-82, Cl. D8-358.000.

Russo Manufacturing Corp.: *See—*
Russo, Richard A., 264,870, Cl. D23-97.000.

Russo, Richard A., to Russo Manufacturing Corp. Coal burning stove. 264,870, 6-8-82, Cl. D23-97.000.

Samson, Robert: *See—*
Karas, Joseph W.; Pfeifer, Robert F.; and Samson, Robert, 264,843, Cl. D14-100.000.

Sandel, Dan. Combined surgical ruler and marking pen. 264,824, 6-8-82, Cl. D10-71.000.

Santa-Eulalia Carvajales, Javier B.: *See—*
Santa-Eulalia Carvajales, Jesus A.; and Santa-Eulalia Carvajales, Javier B., 264,829, Cl. D11-158.000.

Santa-Eulalia Carvajales, Jesus A.; and Santa-Eulalia Carvajales, Javier B., to John J. Madison Co., Inc. Fanciful figurine of a boxer pup. 264,829, 6-8-82, Cl. D11-158.000.

Satoh, Takeshi, to Howard Miller Clock Company. Traveler's alarm clock compact. 264,823, 6-8-82, Cl. D10-15.000.

Savas, Nedim, to Russel William, Ltd. Bathroom display unit. 264,787, 6-8-82, Cl. D6-186.000.

Scavino, Mario; and Marchisi, Giuseppe, to SGS-Ates Componenti Elettronici S.P.A. Electronic memory credit card with frangible portion. 264,853, 6-8-82, Cl. D19-10.000.

Schell, Jerry L.: *See—*
Ross, Charles A.; and Schell, Jerry L., 264,839, Cl. D13-41.000.

Schoenig, Darrell A. Keyboard stand. 264,852, 6-8-82, Cl. D17-9.000.

Seid, Paul, to Sultan Dental Products Ltd. Dental handpiece. 264,876, 6-8-82, Cl. D24-12.000.

SFS Stadler AG: *See—*
Baumgartner, Albert, 264,807, Cl. D8-387.000.

SGS-Ates Componenti Elettronici S.P.A.: *See—*
Scavino, Mario; and Marchisi, Giuseppe, 264,853, Cl. D19-10.000.

Shaffer, George A. Colema board. 264,881, 6-8-82, Cl. D24-51.000.

Shinoda, Lawrence K.: *See—*
Main, John A.; and Shinoda, Lawrence K., 264,836, Cl. D12-211.000.

Shiraishi, Masami, to Tomy Kogyo Co., Inc. Toy locomotive. 264,859, 6-8-82, Cl. D21-129.000.

Sight & Sound International, Inc.: *See—*
Faas, Chuck; and Billings, Zeb, 264,786, Cl. D6-184.000.

Skyer, Robert A.: *See—*
McGirk, James R.; and Skyer, Robert A., 264,774, Cl. D6-48.000.

Smith, Melbourne F., Jr., to Broyhill Furniture Industries, Inc. Armoire. 264,785, 6-8-82, Cl. D6-154.000.

Speakerlab, Inc.: *See—*
Pickrel, Charles, 264,841, Cl. D14-35.000.

Spiegel, Bernt, to C. Joseph Lamy GmbH. Fountain pen. 264,854, 6-8-82, Cl. D19-49.000.

Spirk, John W., Jr.: *See—*
Nottingham, John R.; and Spirk, John W., Jr., 264,856, Cl. D21-60.000.

Spreter, Pierre, to Christian Dior, S.A. Fastener buckle. 264,767, 6-8-82, Cl. D2-427.000.

Stahl, Kay W.: *See—*
Augustsson, Nils E.; Westerlund, Kjell B.; and Stahl, Kay W., 264,874, Cl. D24-3.000.

Stanley Works, The: *See—*
Burgeson, Oscar B.; and Phelps, Richard W., 264,808, Cl. D8-395.000.

Strieber, Edward M. Amusement pitcher. 264,795, 6-8-82, Cl. D7-64.000.

Sultan Dental Products Ltd.: *See—*
Seid, Paul, 264,876, Cl. D24-12.000.

Surgical Engineering Co., Inc.: *See—*
Crocker, Joseph T., 264,875, Cl. D24-7.000.

Sutherland, Paul H. Bed. 264,773, 6-8-82, Cl. D6-5.000.

Swanson, Daniel G., to Hubbard, Lafayette R. Device for measuring and indicating changes in resistance of a living body. 264,877, 6-8-82, Cl. D24-17.000.

T-Star Research, Inc.: *See—*
Kamel, Medhat M.; and Dock, Mortimer R., 264,790, Cl. D6-271.000.

Taguchi, Shuhei, to Matsushita Electric Industrial Co., Ltd. Short wave facsimile receiver. 264,846, 6-8-82, Cl. D14-94.000.

Takeuchi, Masumi, to Organ Needle Col, Ltd. Package of sewing machine needles. 264,809, 6-8-82, Cl. D9-303.000.

Thomas, John S., II, to Wood Products, Inc. Wood bed frame or the like. 264,889, 6-8-82, Cl. D6-80.000.

Thompson, Bruce R., to UPL Group Limited. Toilet brush stand. 264,782, 6-8-82, Cl. D6-86.000.

Thompson, Kevin, to Jermed Limited. Scalpel blade extractor. 264,882, 6-8-82, Cl. D24-99.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Izaki, Kenzou, 264,825, Cl. D10-75.000.

Tomy Kogyo Co., Inc.: *See—*
Ohkado, Tetsuo, 264,855, Cl. D21-10.000.
Shiraishi, Masami, 264,859, Cl. D21-129.000.

Trombley, Ulric W.; and Nozel, Richard J. Trim piece for an automobile hood. 264,833, 6-8-82, Cl. D12-190.000.

Tuck, Winfree P., to Inteo Incorporated. Electronic system housing for printed circuit boards and power source. 264,844, 6-8-82, Cl. D14-100.000.

Tweed, Dennis O. Pet observatory or the like. 264,887, 6-8-82, Cl. D30-1.000.

UPL Group Limited: *See—*
Thompson, Bruce R., 264,782, Cl. D6-86.000.

Urch, Harvey M.: *See—*
Wenger, Jerry A.; Newell, Darrel E.; Urch, Harvey M.; and Johnson, Logan W., 264,779, Cl. D6-78.000.

Voltmann, John D. Plural medicine vial supporting tray and cover. 264,810, 6-8-82, Cl. D9-341.000.

Wahl, Michael, to Marlboro Marketing, Inc. Merchandise display unit. 264,783, 6-8-82, Cl. D6-139.000.

Walmsley, John A. Hockey stick. 264,863, 6-8-82, Cl. D21-210.000.

Watts, Ronald C. Fisherman's cart. 264.888. 6-8-82. Cl. D34-26.000.

Weckman, Richard L., to Clorox Company, The. Bottle. 264,811, 6-8-82, Cl. D9-375.000.

Wenger Corporation: *See—*
Wenger, Jerry A.; Newell, Darrel E.; Urch, Harvey M.; and Johnson, Logan W., 264,779, Cl. D6-78.000.

Wenger, Jerry A.; Newell, Darrel E.; Urch, Harvey M.; and Johnson, Logan W., to Wenger Corporation. Chair. 264,779, 6-8-82, Cl. D6-78.000.

West, Terence H.: *See—*
Daniels, Donald V.; West, Terence H.; and Chou, Albert S., 264,842, Cl. D14-109.000.

Westerlund, Kjell B.: *See—*
Augustsson, Nils E.; Westerlund, Kjell B.; and Stahl, Kay W., 264,874, Cl. D24-3.000.

Wilson, Calvin L.: *See—*
Fallen, Floyd F.; and Wilson, Calvin L., 264,818, Cl. D9-433.000.

Wood Products, Inc.: *See—*
Thomas, John S., II. 264,889. Cl. D6-80.000.

Xerox Corporation: *See—*
Daniels, Donald V.; West, Terence H.; and Chou, Albert S., 264,842, Cl. D14-109.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Ishiyama, Atsushi, 264,830, Cl. D12-7.000.

Yamashina, Naoharu, to Kabushiki Kaisha Bandai Overseas. Combined toy boat and figure therefor. 264,860, 6-8-82, Cl. D21-130.000.

Yardley of London, Inc.: *See—*
Dinand, Pierre, 264,814, Cl. D9-389.000.

Zyla, John F.; and Nemec, John J. Article hanger. 264,789, 6-8-82, Cl. D6-254.000.

LIST OF PLANT PATENTEES

Bailey, Dorothy J. S., to San Joaquin Rose Co. Rose plant. 4,855, 6-8-82, Cl. 11.000.
Olmo, Harold P., to University of California, The Regents of the. Grapevine. 4,856, 6-8-82, Cl. 47.000.
San Joaquin Rose Co.: *See*— Bailey, Dorothy J. S., 4,855, Cl. 11.000.
University of California, The Regents of the: *See*— Olmo, Harold P., 4,856, Cl. 47.000.

CLASSIFICATION OF PATENTS

ISSUED JUNE 8, 1982

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2 4,333,179
10 4,333,180
24 4,333,181
265 4,333,182
400 4,333,183

CLASS 4

313 4,333,184
319 4,333,185
506 4,333,186
514 4,333,188
608 4,333,187

CLASS 6

5 4,333,189

CLASS 8

151 4,333,190
407 4,333,730
436 4,333,731
527 4,333,732

CLASS 12

142 E 4,333,192
142 RS 4,333,193

CLASS 14

71.5 4,333,194
4,333,195
71.7 4,333,196

CLASS 15

22 R 4,333,197
119 A 4,333,198
167 R 4,333,199
243 4,333,200
301 4,333,201
320 4,333,202
321 4,333,203
4,333,204
345 4,333,205

CLASS 16

35 R 4,333,207
335 4,333,206

CLASS 23

230 B 4,333,733
4,333,734
232 R 4,333,735
295 S 4,333,736
297 4,333,737

CLASS 24

1 4,333,208
30.5 R 4,333,210
221 R 4,333,211
233 4,333,212
263 DA 4,333,209

CLASS 29

25.42 4,333,213
80 4,333,214
149.5 S 4,333,215
157 R 4,333,216
243.51 4,333,217
402.16 4,333,218
403.3 4,333,219
407 4,333,220
413 4,333,221
445 4,333,222
447 4,333,223
571 4,333,224
4,333,225
576 B 4,333,226
580 4,333,227
599 4,333,228
603 4,333,229
749 4,333,230
764 4,333,231
767 4,333,232
845 4,333,233

CLASS 30

2 4,333,234
259 4,333,235
380 4,333,236

CLASS 33

143 R 4,333,237
174 C 4,333,239
174 G 4,333,240
174 L 4,333,238
174 T 4,333,241
227 4,333,242
268 4,333,243
290 4,333,244
438 4,333,245

CLASS 34

23 4,333,246

CLASS 36

11.5 4,333,247
72 R 4,333,248
115 4,333,249

CLASS 37

117.5 4,333,250
118 R 4,333,251

CLASS 38

144 4,333,252

CLASS 40

10 R 4,333,253
158 B 4,333,254
310 Re.30,958
374 Re.30,959
524 4,333,255

CLASS 42

71 P 4,333,256

CLASS 43

57.5 R 4,333,257

CLASS 44

15 B 4,333,738
52 4,333,739
56 4,333,740
62 4,333,741

CLASS 46

14 4,333,258
132 4,333,259
220 4,333,260
257 4,333,261
266 4,333,262

CLASS 47

1.4 4,333,263
42 4,333,264
58 4,333,266
74 4,333,265
84 4,333,267

CLASS 48

77 4,333,742

CLASS 49

34 4,333,268
280 4,333,269
336 4,333,270
464 4,333,271
505 4,333,272

CLASS 51

102 4,333,273
160 4,333,274
298 4,333,743
320 4,333,275
422 4,333,276
425 4,333,277
434 4,333,278

CLASS 52

105 4,333,279
167 4,333,280
169.5 4,333,281
172 4,333,282
202 4,333,283
222 4,333,284
252 4,333,285
281 4,333,286
311 4,333,287
312 4,333,288
364 4,333,289
376 4,333,290
404 4,333,291
4,333,292
692 4,333,293
695 4,333,294
730 4,333,295

CLASS 53

64 4,333,296
252 4,333,297
447 4,333,298
450 4,333,299
569 4,333,300
587 4,333,301

CLASS 55

25 4,333,744
97 4,333,745
106 4,333,746
178 4,333,747
202 4,333,748
257 PV 4,333,749
259 4,333,750
387 4,333,752
390 4,333,751

CLASS 56

10.5 4,333,302
11.3 4,333,303
119 4,333,304
327 R 4,333,305

CLASS 57

206 4,333,306
334 4,333,307
339 4,333,308

CLASS 60

39.09 D 4,333,309
39.18 B 4,333,310
496 4,333,311
641.7 4,333,312
649 4,333,313
675 4,333,314

CLASS 62

1 4,333,315
5 4,333,754
6 4,333,755
9 4,333,753
126 4,333,316
212 4,333,317
374 4,333,318

CLASS 65

25.1 4,333,756

CLASS 66

63 4,333,320
192 4,333,321

CLASS 68

23.2 4,333,322
171 4,333,323

CLASS 70

107 4,333,324
186 4,333,325
203 4,333,326
276 4,333,327
278 4,333,328

CLASS 71

5 4,333,757
80 4,333,758
88 4,333,759
92 4,333,760

CLASS 72

3 4,333,329
392 4,333,330

CLASS 73

4 R 4,333,331
35 4,333,334
41 4,333,335
56 4,333,336
114 4,333,337
119 A 4,333,338
379 4,333,340
382 R 4,333,341
516 R 4,333,342
538 4,333,343
584 4,333,344
606 4,333,345
4,333,346
642 4,333,347
708 4,333,348
4,333,349
715 4,333,350
761 4,333,351
861.18 4,333,352
861.25 4,333,353
861.77 4,333,354
861.91 4,333,355
864.21 4,333,356

CLASS 74

110 4,333,357
359 4,333,358
467 4,333,359
473 P 4,333,360
501 P 4,333,361
812 4,333,362
826 4,333,363

CLASS 75

35 4,333,761
69 4,333,762
77 4,333,763

CLASS 76

108 A 4,333,364

CLASS 81

57.16 4,333,365
170 4,333,366
430 4,333,367

CLASS 82

1 C 4,333,368

CLASS 83

24 4,333,369
56 4,333,370
169 4,333,371
324 4,333,372
419 4,333,373

CLASS 84

1.01 4,333,374
4,333,375
1.27 4,333,376
4,333,377
280 4,333,378
297 S 4,333,379

CLASS 87

6 4,333,380

CLASS 89

1 B 4,333,381
1.803 4,333,384
1.806 4,333,382
7 4,333,383
33 SF 4,333,386
37 BA 4,333,385

CLASS 91

1 4,333,387
186 4,333,388
446 4,333,389
467 4,333,390

CLASS 92

121 4,333,391

CLASS 98

1 4,333,392

CLASS 99

277.2 4,333,393

CLASS 100

42 4,333,394
233 4,333,395
4,333,396
4,333,397

CLASS 101

93.02 4,333,398
401.2 4,333,399

CLASS 102

348 4,333,400
487 4,333,401
505 4,333,402

CLASS 105

197 R 4,333,403
225 4,333,404

CLASS 106

87 4,333,764
98 4,333,765
100 4,333,766
161 4,333,767

CLASS 110

264 4,333,405
340 4,333,406

CLASS 112

121.15 4,333,408
121.27 4,333,409
162 4,333,410
237 4,333,407
278 4,333,411

CLASS 114

39 4,333,412
67 A 4,333,413
322 4,333,414
344 4,333,191

CLASS 116

217 4,333,339

CLASS 118

16 4,333,415
47 4,333,416
50 4,333,417
106 4,333,418
405 4,333,419
411 4,333,420

CLASS 119

14.08 4,333,421

CLASS 123

3 4,333,422
23 4,333,423
39 4,333,424
73 R 4,333,425
90.27 4,333,426
190 A 4,333,427
198 F 4,333,428
274 4,333,429
321 4,333,430
323 4,333,431
366 4,333,432
420 4,333,433
478 4,333,434
489 4,333,435
502 4,333,436
4,333,437
569 4,333,438
4,333,439
4,333,440
590 4,333,441
599 4,333,442

CLASS 124

24 R 4,333,443

CLASS 126

417 4,333,444
424 Re.30,960
425 Re.30,961
436 4,333,445
438 4,333,446
443 4,333,447
452 4,333,448

CLASS 127

46.2 4,333,768
4,333,769
46.3 4,333,770

CLASS 128

155 4,333,449
200.14 4,333,450
205.12 4,333,451
205.24 4,333,452
4,333,453
214 R 4,333,454
214.4 4,333,455
218 F 4,333,459
218 R 4,333,456
4,333,457
4,333,458
239 4,333,460
284 4,333,461
287 4,333,462
4,333,463
290 R 4,333,464
4,333,465
4,333,466
303.14 4,333,467
348 4,333,468
419 F 4,333,469
419 PG 4,333,470
505 4,333,471
581 4,333,472
635 4,333,473
660 4,333,474
711 4,333,475
720 4,333,476
736 4,333,477
764 4,333,478
766 4,333,479
767 4,333,480

CLASS 131

276 4,333,481
300 4,333,482
352 4,333,483
359 4,333,484

CLASS 134

7 4,333,771
18 4,333,772
22 C 4,333,773
60 4,333,485

CLASS 136

248 4,334,120

CLASS 137

1 4,333,486
2 4,333,487
13 4,333,488
77 4,333,489
78.3 4,333,490
116.3 4,333,491
119 4,333,492
268 4,333,493
364 4,333,494
484.2 4,333,495
489 4,333,496
625.17 4,333,497
625.62 4,333,498
812 4,333,499
863 4,333,500

CLASS 139

1 R 4,333,501
425 A 4,333,502

CLASS 141

8 4,333,503
55 4,333,504
383 4,333,505

CLASS 145

3.1 4,333,506

CLASS 148

1.5 4,333,774
11.5 Q 4,333,775
36 4,333,776
128 4,333,777

CLASS 152

359 4,333,507
367 4,333,508

CLASS 156

61 4,333,778
73.1 4,333,779
78 4,333,780
152 4,333,781
164 4,333,782
187 4,333,783
252 4,333,784
281 4,333,785
306.6 4,333,786
307.3 4,333,787
405 R 4,333,788
499 4,333,789
510 4,333,790
580.1 4,333,791
612 4,333,792
643 4,333,793
648 4,333,794

CLASS 160

173 4,333,509
177 4,333,510
267 R 4,333,511

CLASS 162

168 N 4,333,795

CLASS 164

453 4,333,512
526 4,333,513

CLASS 165

1 4,333,514
4,333,515
4,333,516
4,333,517
8 4,333,518
12 4,333,519
59 4,333,520
63 4,333,521
69 4,333,522
73 4,333,523
104.16 4,333,524
104.21 4,333,525

CLASS 166

87 4,333,526
117.5 4,333,527
4,333,528
267 4,333,529
289 4,333,530
341 4,333,531

CLASS 168

24 4,333,532

CLASS 172

155 4,333,533
464 4,333,534
572 4,333,535
721 4,333,536

CLASS 173

17 4,333,537
104 4,333,538

CLASS 174

15 S 4,334,123
68 C 4,334,121
94 R 4,334,122

CLASS 175

61 4,333,539
162 4,333,541
299 4,333,542
329 4,333,540

CLASS 177

134 4,333,543

CLASS 178

19 4,334,124

CLASS 179

1 GE 4,334,125
18 ES 4,334,126
115.5 R 4,334,127
170.2 4,334,128
175.11 4,334,129

CLASS 181

266 4,333,544
282 4,333,545

CLASS 182

48 4,333,546
90 4,333,547

CLASS 185

33 4,333,548

CLASS 187

93 4,333,549

CLASS 188

72.2 4,333,550
372 4,333,551

CLASS 192

3.29 4,333,552
4 A 4,333,553
58 R 4,333,555
70.19 4,333,554

CLASS 194

92 4,333,556
97 A 4,333,557

CLASS 198

391 4,333,558
461 4,333,559
519 4,333,560
703 4,333,561

CLASS 200

61.54 4,334,130
82 R 4,334,131
153 LB 4,334,132
279 4,334,133
314 4,334,134

CLASS 203

67 4,333,799
87 4,333,800
94 4,333,801

CLASS 204

54 R 4,333,802
67 4,333,803
98 4,333,804
4,333,805
129.1 4,333,806
159.14 4,333,809
181 T 4,333,807
192 D 4,333,808
195 G 4,333,812
195 M 4,333,810
195 S 4,333,811
243 R 4,333,813
298 4,333,814

CLASS 206

37 4,333,562
53 4,333,563
216 4,333,564
329 4,333,565
343 4,333,566
368 4,333,567
387 4,333,568
431 4,333,569
432 4,333,570
499 4,333,571

CLASS 208

10 4,333,815
91 4,333,816
101 4,333,817
4,333,818
4,333,819
4,333,820
120 4,333,821
184 4,333,822
325 4,333,823
326 4,333,824

CLASS 209

17 4,333,572
223 A 4,333,825
536 Re.30,964

CLASS 210

94 4,333,826
100 4,333,827
113 4,333,828
169 4,333,829
170 4,333,830
4,333,831
195.2 4,333,832
198.1 4,333,833
219 4,333,834
305 4,333,835
404 4,333,836
602 4,333,837
614 4,333,838
777 4,333,839

CLASS 211

11 4,333,573
60 R 4,333,574
118 4,333,575

CLASS 213

61 4,333,576

CLASS 215

246 4,333,577
253 4,333,578

CLASS 219

10.49 R 4,334,135
10.55 B 4,334,136
10.55 F 4,334,137
64 4,334,138
121 EW 4,334,139
127 4,334,140
283 4,334,141
301 4,334,142
333 4,334,143
383 4,334,144
453 4,334,145
492 4,334,146
497 4,334,147
553 4,334,148

CLASS 220

4 R 4,333,579
5 A 4,333,580
20 4,333,581
23.6 Re.30,962
66 4,333,582
90.4 4,333,583
309 4,333,584
359 4,333,585

CLASS 221

106 4,333,586

CLASS 222

129.1 4,333,587
164 4,333,588
402.11 4,333,589

CLASS 223

85 4,333,590

CLASS 224

160 4,333,591

CLASS 226

52 4,333,592
122 4,333,593
176 4,333,594

CLASS 227

10 4,333,595
67 4,333,596

CLASS 228

108 4,333,597
181 4,333,598

CLASS 229

5.7 4,333,599
42 4,333,600
43 4,333,601
44 R 4,333,602

CLASS 232

17 4,333,603

CLASS 235

92 MP 4,334,149

CLASS 236

46 R 4,333,604
78 R 4,333,605

CLASS 237

12.3 A 4,333,606

CLASS 239

13 4,333,607
118 4,333,608
124 4,333,609
224 Re.30,963
601 4,333,610

CLASS 241

1 4,333,611
33 4,333,612
34 4,333,613

CLASS 242

1 4,333,614
71.1 4,333,615
72 R 4,333,616
86.52 4,333,617
192 4,333,618
195 4,333,619
199 4,333,620

CLASS 244

138 R 4,333,621

CLASS 248

176 4,333,623
188.8 4,333,622
205 R 4,333,624
216.1 4,333,625
360 4,333,626
396 4,333,627
551 4,333,628

CLASS 249

119 4,333,629
135 4,333,630

CLASS 250

201 4,334,150
4,334,151
226 4,334,152
405 4,334,153
445 T 4,334,154
490 4,334,155
491 4,334,156

CLASS 251

159 4,333,631
214 4,333,632
320 4,333,633

CLASS 252

16 4,333,840
32.7 E 4,333,841
62.9 4,333,842
75 4,333,843
97 4,333,844
170 4,333,845
184 4,333,846
301.4 P 4,333,848
316 4,333,849
389 A 4,333,850
429 B 4,333,851
429 R 4,333,852
435 4,333,853
439 4,333,854
4,333,855
441 4,333,856
455 R 4,333,858
455 Z 4,333,857
4,333,859
458 4,333,860
518 4,333,861
547 4,333,862
629 4,333,847

CLASS 254

106 4,333,634

CLASS 260

112 B 4,333,870
112 R 4,333,871
112.5 E 4,333,873
112.5 R 4,333,872
153 4,333,874
239 BC 4,333,875
245.73 4,333,876
397.1 4,333,880
429 R 4,333,881
453.3 4,333,882
544 C 4,333,883
546 4,333,884
549 4,333,885

CLASS 261

18 R 4,333,886
27 4,333,887
34 B 4,333,888
39 B 4,333,889
41 D 4,333,890
4,333,891
94 4,333,892
4,333,893
96 4,333,894

CLASS 264

24 4,333,895
40.3 4,333,906
40.5 4,333,896
40.6 4,333,897
45.9 4,333,898
51 4,333,899
85 4,333,900
4,333,901
165 4,333,903
290.2 4,333,907
320 4,333,902
323 4,333,904
529 4,333,905

CLASS 266

64 4,333,635
68 4,333,636

CLASS 269

322 4,333,637
4,333,638

CLASS 271

3.1 4,333,639
9 4,333,640
289 4,333,641

CLASS 272

1 D 4,333,642
106 4,333,643
118 4,333,644
130 4,333,645

CLASS 273

29 A 4,333,646
54 B 4,333,647
65 EB 4,333,648
73 D 4,333,649
4,333,650
129 V 4,333,651
153 S 4,333,652
160 4,333,653
241 4,333,654
4,333,655
299 4,333,656
376 4,333,657
411 4,333,658

CLASS 277

1 4,333,659
9 4,333,660
203 4,333,661
207 A 4,333,662
235 R 4,333,663

CLASS 280

261 4,333,664
408 4,333,665
435 4,333,666
605 4,333,667
703 4,333,668

CLASS 285

21 4,333,669
173 4,333,670
4,333,671
382.2 4,333,672

CLASS 292

59 4,333,673

CLASS 293

120 4,333,674

CLASS 294

78 R 4,333,675
88 4,333,676
147 4,333,677

CLASS 296

39 R 4,333,678
161 4,333,679
216 4,333,680

CLASS 297

83 4,333,681
192 4,333,682
292 4,333,683

CLASS 299

2 4,333,684
39 4,333,685
4,333,686
81 4,333,687

CLASS 301

36 R 4,333,688

CLASS 307

291 4,334,157
462 4,334,158

CLASS 308

3 R 4,333,689
3.8 4,333,690
8.2 4,333,691
9 4,333,692
176 4,333,693
187.2 4,333,694
211 4,333,695

CLASS 310

54 4,334,159
57 4,334,160
68 C 4,334,162
68 E 4,334,161
90 4,334,163
114 4,334,164
233 4,334,165
268 4,334,166
313 R 4,334,167
343 4,334,168

CLASS 313

414 4,334,169

CLASS 315

16 4,334,170
199 4,334,171
289 4,334,172
399 4,334,173
408 4,334,174

CLASS 318

66 4,334,175
102 4,334,176
345 G 4,334,177
572 4,334,178
661 4,334,179
687 4,334,180
762 4,334,181
808 4,334,182

CLASS 323

235 4,334,183
4,334,184
280 4,334,185
365 4,334,186

CLASS 324

58 R 4,334,187
133 4,334,188
158 MG 4,334,189
171 4,334,190
329 4,334,191
4,334,192
437 4,334,193

CLASS 328

42 4,334,194
168 4,334,195

CLASS 330

253 4,334,196
268 4,334,197
296 4,334,198

CLASS 333

202 4,334,201
218 4,334,202
226 4,334,203

CLASS 335

205 4,334,204
220 4,334,205

CLASS 336

96 4,334,206
136 4,334,207
192 4,334,208

CLASS 337

112 4,334,209
343 4,334,210

CLASS 339

17 LM 4,333,696
31 R 4,333,697
36 4,333,698
61 M 4,333,699
97 P 4,333,701
97 R 4,333,700
217 R 4,333,702
217 S 4,333,703

CLASS 340

88 4,334,211
347 DA 4,334,212
347 DD 4,334,213
539 4,334,215
552 4,334,214
679 4,334,216
685 4,334,217
689 4,334,218
712 4,334,219
753 4,334,220
825.72 4,334,221
870.29 4,334,222

CLASS 343

5 W 4,334,223
6.5 R 4,334,224
100 LE 4,334,225
100 ST 4,334,226
719 4,334,227
722 4,334,228
767 4,334,229
797 4,334,230

CLASS 346

35 4,334,231
75 4,334,232
135.1 4,334,233
140 R 4,334,234

CLASS 350

96.10 4,333,704
96.20 4,333,705
96.23 4,333,706
144 4,333,707
346 4,333,708
350 R 4,333,709
357 4,333,710
426 4,333,711
430 4,333,712
432 4,333,713
460 4,333,714

CLASS 352

98 4,333,715

CLASS 354

25 4,333,716
4,333,717
31 4,333,718
132 4,333,719
227 4,333,720
234 4,333,721
4,333,722

CLASS 355

71 4,333,723

CLASS 356

437 4,333,724

CLASS 357

23 4,334,235
59 4,334,236

CLASS 358

36 4,334,237
43 4,334,238
44 4,334,239
78 4,334,240
107 4,334,241
127 4,334,242
153 4,334,243
166 4,334,244
183 4,334,245
261 4,334,246

CLASS 360

10 4,334,247
12 4,334,248
30 4,334,249
45 4,334,250
96.6 4,334,251
104 4,334,252
137 4,334,253

CLASS 361

9 4,334,254
22 4,334,255
56 4,334,256
119 4,334,257
170 4,334,258
212 4,334,259
360 4,334,260
426 4,334,261

CLASS 362

11 4,334,262

CLASS 363

25	4,334,263
51	4,334,264
72	4,334,265
133	4,334,267

CLASS 364

167	4,334,266
200	4,334,268
	4,334,269
300	4,334,270
422	4,334,271
474	4,334,272
484	4,334,273
515	4,334,274
551	4,334,275
561	4,334,276
703	4,334,277
709	4,334,278
710	4,334,279
	4,334,280
723	4,334,281
728	4,334,282
744	4,334,283
748	4,334,284
761	4,334,285
900	4,334,286
	4,334,287
	4,334,288
	4,334,289

CLASS 365

1	4,334,290
36	4,334,291
182	4,334,292
190	4,334,293
203	4,334,294
222	4,334,295

CLASS 367

180	4,334,296

CLASS 368

18	4,334,297
63	4,334,298

CLASS 369

44	4,334,299
46	4,334,300
116	4,334,301
261	4,334,302

CLASS 370

13	4,334,303
66	4,334,304
86	4,334,305
94	4,334,306

CLASS 371

16	4,334,307
29	4,334,308
38	4,334,309
64	4,334,310

CLASS 372

47	4,334,311
57	4,334,199
90	4,334,200

CLASS 373

159	4,334,119

CLASS 374

8	4,333,333
10	4,333,332

CLASS 375

20	4,334,312
106	4,334,313
111	4,334,314

CLASS 376

100	4,333,796
210	4,333,797
449	4,333,798

CLASS 403

271	4,333,725

CLASS 405

72	4,333,726

CLASS 408

191	4,333,727

CLASS 416

134 A	4,333,728

CLASS 417

313	4,333,729

CLASS 422

61	4,333,908
141	4,333,909
228	4,333,910

CLASS 423

2	4,333,911
20	4,333,912
184	4,333,913
314	4,333,914
324	4,333,915
371	4,333,916
522	4,333,917

CLASS 424

1	4,333,918
15	4,333,919
59	4,333,920
70	4,333,921
89	4,333,922
115	4,333,923
170	4,333,924
181	4,333,925
182	4,333,926
238	4,333,927
243	4,333,928
246	4,333,929
248.51	4,333,930
248.54	4,333,931
248.56	4,333,932
249	4,333,933
250	4,333,934
	4,333,935
251	4,333,936
	4,333,937
263	4,333,938
	4,333,939
	4,333,940
267	4,333,941
	4,333,942
269	4,333,943
	4,333,944
270	4,333,945
273 R	4,333,946
	4,333,947
285	4,333,948
300	4,333,949
305	4,333,950
319	4,333,951
330	4,333,952

CLASS 426

34	4,333,953
41	4,333,954
44	4,333,955
69	4,333,956
140	4,333,957
583	4,333,958
614	4,333,959
625	4,333,960

CLASS 427

13	4,333,961
37	4,333,962
44	4,333,963
93	4,333,964
	4,333,965
96	4,333,966
148	4,333,967
173	4,333,968
222	4,333,969
	4,333,970
244	4,333,972
389.9	4,333,971
424	4,333,973

CLASS 428

16	4,333,974
65	4,333,975
91	4,333,976
131	4,333,977
158	4,333,978
179	4,333,979
192	4,333,980
215	4,333,981
245	4,333,982
336	4,333,983
	4,333,984
	4,333,985
402	4,333,986
419	4,333,987
425.9	4,333,988
446	4,333,989
531	4,333,990
702	4,333,991

CLASS 429

17	4,333,992
27	4,333,993
94	4,333,994
172	4,333,995
191	4,333,996
218	4,333,997

CLASS 430

12	4,333,998
17	4,333,999
58	4,334,000
83	4,334,001
103	4,334,002
156	4,334,003
176	4,334,004
211	4,334,005
254	4,334,006
270	4,334,007
	4,334,008
291	4,334,009
551	4,334,010
552	4,334,011
567	4,334,012
569	4,334,013
611	4,334,014

CLASS 435

1	4,334,015
5	4,334,016
7	4,334,017
13	4,334,018
68	Re.30,965
76	4,334,019
110	4,334,020
118	4,334,021
119	4,334,022
163	4,334,026
178	4,334,027
190	4,334,023
232	4,334,024
253	4,334,025
284	4,334,028

CLASS 455

11	4,334,315
62	4,334,322
139	4,334,316
179	4,334,323
194	4,334,317
195	4,334,318
227	4,334,319
	4,334,320
333	4,334,324
614	4,334,321

CLASS 464

26	4,333,319

CLASS 501

109	4,334,029

CLASS 521

90	4,334,030
106	4,334,031
115	4,334,032
159	4,334,033

CLASS 523

220	4,333,863
410	4,333,865

CLASS 524

100	4,333,869
152	4,333,868
534	4,333,866
547	4,333,867

CLASS 525

28	4,334,034
34	4,334,035
53	4,334,041
102	4,334,036
199	4,334,037
207	4,334,038
263	4,334,039
321	4,334,040
339	4,334,042
370	4,334,043
379	4,334,044
390	4,334,050
439	4,334,045
501.5	4,333,864

CLASS 526

93	4,334,046
138	4,334,047
170	4,334,048
202	4,334,049

CLASS 528

25	4,334,051
52	4,334,052
179	4,334,053
210	4,334,054
229	4,334,055
496	4,334,056
500	4,334,057

CLASS 536

8	4,334,058
23	4,334,059
35	4,334,060
119	4,334,061

CLASS 544

28	4,334,063
30	4,334,064
	4,334,065
026	4,334,062
149	4,334,066
151	4,334,067
187	4,334,068
237	4,334,069

CLASS 546

70	4,334,070
74	4,334,071
112	4,334,072
245	4,334,073
327	4,334,074

CLASS 548

239	4,334,075
375	4,334,076
421	4,333,877
531	4,333,878

CLASS 549

12	4,334,077
43	4,334,078
549	4,333,879

CLASS 560

75	4,334,079
99	4,334,080
130	4,334,081
180	4,334,082
226	4,334,083

CLASS 562

410	4,334,084
413	4,334,086
459	4,334,087
462	4,334,088
463	4,334,089
480	4,334,090
506	4,334,091
517	4,334,092
	4,334,093
	4,334,094
584	4,334,095

CLASS 564

72	4,334,096
201	4,334,097
367	4,334,085

CLASS 568

347	4,334,098
386	4,334,099
444	4,334,100
454	4,334,101
621	4,334,102
631	4,334,103
649	4,334,104
682	4,334,105
719	4,334,106
749	4,334,107
803	4,334,108
841	4,334,109
932	4,334,110

CLASS 570

143	4,334,111
207	4,334,112

CLASS 585

18	4,334,113
407	4,334,114
	4,334,115
440	4,334,116
509	4,334,117
529	4,334,118

CLASSIFICATION OF DESIGNS

D2—	28	264,765
	408	264,766
	427	264,767
D3—	30.1	264,768
	33	264,769
	35	264,770
		264,771
	38	264,772
D6—	5	264,773
	48	264,774
	57	264,775
	63	264,776
	78	264,777
		264,778
		264,779
	80	264,889
	82	264,780
	85	264,781
	86	264,782
	139	264,783
	144	264,784
	154	264,785
	184	264,786
	186	264,787
	201	264,788
	254	264,789
	271	264,790
D7—	1	264,791
		264,792
	18	264,793
	41	264,794
	64	264,795
D8—	17	264,796
	62	264,797
	78	264,798
	99	264,799
		264,800
		264,801
		264,802
		264,803
		264,804
	107	264,805
	358	264,806
	387	264,807
	395	264,808
D9—	303	264,809
	341	264,810
	375	264,811
	385	264,812
		264,813
	389	264,814
	415	264,815
	424	264,816
	433	264,817
		264,818
	449	264,819
	457	264,820
D10—	2	264,821
	10	264,822
	15	264,823
	71	264,824
	75	264,825
	106	264,826
D11—	34	264,827
	87	264,828
	158	264,829
D12—	7	264,830
	156	264,831
	157	264,832
	190	264,833
	210	264,834
	211	264,835
		264,836
	324	264,837
		264,838
D13—	41	264,839
D14—	31	264,840
	35	264,841
	68	264,845
	94	264,846
	100	264,843
		264,844
	109	264,842
	110	264,847
D15—	72	264,848
	132	264,849
D16—	11	264,850
	134	264,851
D17—	9	264,852
D19—	10	264,853
	49	264,854
D21—	10	264,855
	16	264,857
	60	264,856
	107	264,858
	129	264,859
	130	264,860
	137	264,861
	191	264,862
	210	264,863
	218	264,864
	219	264,865
	221	264,866
D22—	18	264,867
	27	264,868
D23—	78	264,869
	97	264,870
	129	264,871
	146	264,872
D24—	1.1	264,873
	3	264,874
	7	264,875
	12	264,876
	17	264,877
	21	264,878
	31	264,879
	46	264,880
	51	264,881
	99	264,882
D25—	87	264,886
D27—	3	264,885
	03	264,883
		264,884
D30—	1	264,887
D34—	26	264,888

CLASSIFICATION OF PLANTS

P.—	11	4,855
	47	4,856

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,333,813
4,334,124
02 : 4,333,591
04 : 4,333,231
4,333,288
4,333,290
4,333,401
4,333,603
4,333,653
4,333,789
4,333,887
4,334,145
4,334,179
4,334,222
4,334,283
4,334,289
05 : 4,333,355
4,333,443
4,333,642
06 : Re.30,961
4,333,183
4,333,191
4,333,195
4,333,225
4,333,227
4,333,229
4,333,253
4,333,256
4,333,258
4,333,261
4,333,277
4,333,280
4,333,293
4,333,312
4,333,313
4,333,314
4,333,328
4,333,382
4,333,386
4,333,387
4,333,388
4,333,417
4,333,420
4,333,427
4,333,441
4,333,450
4,333,453
4,333,472
4,333,476
4,333,495
4,333,496
4,333,509
4,333,526
4,333,528
4,333,532
4,333,562
4,333,563
4,333,580
4,333,581
4,333,598
4,333,607
4,333,610
4,333,618
4,333,622
4,333,634
4,333,638
4,333,651
4,333,655
4,333,659
4,333,661
4,333,664
4,333,670
4,333,671
4,333,681
4,333,703
4,333,746
4,333,748
4,333,757
4,333,790
4,333,812
4,333,815
4,333,832
4,333,839
4,333,857
4,333,863
4,333,905
4,333,961
4,333,972
4,333,983
4,334,028
4,334,074
4,334,087
4,334,118
4,334,148
4,334,154
4,334,160
4,334,212
4,334,213
4,334,223
4,334,229
4,334,244
4,334,246
4,334,247
4,334,259
4,334,277
4,334,284
4,334,288
08 : 4,333,246
4,333,279
4,333,395
4,333,597
4,333,639
4,333,684
4,333,718
09 : 4,333,239
4,333,315
4,333,342
4,333,351
4,333,368
4,333,549
4,333,604
4,333,694
4,333,697
4,333,742
4,333,798
4,333,992
4,334,000
4,334,106
4,334,182
4,334,248
10 : 4,333,568
4,333,760
4,333,987
4,334,082
12 : 4,333,180
4,333,182
4,333,194
4,333,199
4,333,208
4,333,216
4,333,271
4,333,289
4,333,305
4,333,354
4,333,474
4,333,479
4,333,641
4,333,677
4,333,704
4,333,713
4,333,765
4,334,126
4,334,193
4,334,309
13 : 4,333,565
15 : 4,333,204
16 : 4,333,448
17 : 4,333,188
4,333,213
4,333,214
4,333,217
4,333,230
4,333,252
4,333,254
4,333,264
4,333,302
4,333,318
4,333,326
4,333,336
4,333,337
4,333,376
4,333,377
4,333,397
4,333,403
4,333,451
4,333,462
4,333,463
4,333,480
4,333,493
4,333,513
4,333,516
4,333,524
4,333,576
4,333,584
4,333,599
4,333,600
4,333,628
4,333,633
4,333,647
4,333,657
4,333,740
4,333,768
4,333,769
4,333,770
4,333,776
4,333,782
4,333,801
4,333,817
4,333,818
4,333,819
4,333,820
4,333,821
4,333,823
4,333,835
4,333,850
4,333,854
4,333,856
4,333,973
4,333,993
4,334,003
4,334,026
4,334,047
4,334,085
4,334,134
4,334,162
4,334,164
4,334,170
4,334,173
4,334,174
4,334,176
4,334,177
4,334,185
4,334,203
4,334,211
4,334,215
4,334,243
4,334,323
18 : 4,333,207
4,333,278
4,333,360
4,333,390
4,333,442
4,333,446
4,333,460
4,333,523
4,333,554
4,333,589
4,333,668
4,333,672
4,333,737
4,333,873
4,333,919
4,333,923
4,333,941
4,333,943
4,334,019
4,334,063
4,334,064
4,334,065
4,334,071
4,334,079
4,334,088
4,334,131
4,334,267
19 : 4,333,535
4,333,617
4,334,181
20 : 4,333,685
4,333,686
4,333,749
21 : 4,333,205
4,333,322
4,333,588
4,333,738
4,333,831
4,334,132
4,334,135
4,334,143
4,334,147
22 : 4,333,654
4,333,810
4,333,878
4,334,061
23 : 4,334,157
4,334,209
24 : Re.30,959
4,333,344
4,333,383
4,333,400
4,333,413
4,333,636
4,333,827
4,333,847
4,334,270
4,334,321
25 : 4,333,224
4,333,330
4,333,366
4,333,380
4,333,605
4,333,626
4,333,700
4,333,755
4,333,792
4,333,977
4,333,980
4,334,017
4,334,030
4,334,039
4,334,172
4,334,254
4,334,261
4,334,307
26 : 4,333,186
4,333,202
4,333,203
4,333,255
4,333,361
4,333,385
4,333,394
4,333,426
4,333,434
4,333,497
4,333,552
4,333,553
4,333,678
4,333,745
4,333,750

4,333,752
4,333,780
4,333,781
4,333,825
4,333,845
4,333,883
4,333,888
4,333,891
4,334,031
4,334,032
4,334,049
4,334,052
4,334,069
4,334,111
4,334,188
27 : 4,333,200
4,333,444
4,333,468
4,333,470
4,333,561
4,333,587
4,333,624
4,333,826
4,333,997
4,334,015
4,334,231
29 : 4,333,455
4,333,477
4,333,666
4,333,674
4,333,680
4,333,741
4,333,971
4,334,297
31 : 4,333,602
4,334,024
32 : 4,333,234
4,333,265
33 : 4,333,629
4,333,805
4,333,901
4,334,008
34 : Re.30,958
4,333,220
4,333,260
4,333,299
4,333,300
4,333,349
4,333,457
4,333,458
4,333,461
4,333,475
4,333,481
4,333,494
4,333,503
4,333,557
4,333,592
4,333,649
4,333,696
4,333,699
4,333,708
4,333,727
4,333,735

4,333,762
4,333,763
4,333,786
4,333,793
4,333,814
4,333,840
4,333,859
4,333,872
4,333,909
4,333,920
4,333,921
4,333,925
4,334,041
4,334,045
4,334,060
4,334,070
4,334,078
4,334,081
4,334,091
4,334,098
4,334,102
4,334,105
4,334,142
4,334,187
4,334,194
4,334,196
4,334,198
4,334,200
4,334,237
4,334,291
4,334,313
4,334,324
35 : 4,333,539
36 : 4,333,179
4,333,181
4,333,197
4,333,206
4,333,211
4,333,262
4,333,286
4,333,323
4,333,341
4,333,353
4,333,409
4,333,411
4,333,416
4,333,424
4,333,447
4,333,456
4,333,467
4,333,505
4,333,517
4,333,518
4,333,519
4,333,556
4,333,564
4,333,579
4,333,583
4,333,596
4,333,614
4,333,625
4,333,650
4,333,652

4,333,656
4,333,682
4,333,683
4,333,690
4,333,701
4,333,722
4,333,723
4,333,733
4,333,734
4,333,794
4,333,796
4,333,875
4,333,889
4,333,893
4,333,896
4,333,900
4,333,940
4,333,950
4,333,964
4,333,965
4,333,968
4,333,981
4,333,998
4,333,999
4,334,005
4,334,009
4,334,048
4,334,050
4,334,058
4,334,062
4,334,099
4,334,109
4,334,129
4,334,158
4,334,165
4,334,195
4,334,199
4,334,221
4,334,258
4,334,310
37 : Re.30,964
4,333,339
4,333,367
4,333,548
4,333,574
4,333,706
4,333,761
4,333,772
4,333,871
4,334,122
39 : 4,333,193
4,333,215
4,333,244
4,333,291
4,333,292
4,333,303
4,333,369
4,333,389
4,333,399
4,333,404
4,333,415
4,333,433
4,333,508

4,333,515
4,333,521
4,333,540
4,333,546
4,333,569
4,333,570
4,333,577
4,333,616
4,333,630
4,333,632
4,333,714
4,333,754
4,333,756
4,333,779
4,333,785
4,333,787
4,333,788
4,333,848
4,333,849
4,333,853
4,333,866
4,333,899
4,333,994
4,333,996
4,334,116
4,334,161
4,334,232
4,334,262
40 : Re.30,965
4,333,240
4,333,250
4,333,276
4,333,488
4,333,490
4,333,499
4,333,500
4,333,665
4,333,688
4,333,715
4,333,725
4,333,855
4,333,860
4,334,115
41 : 4,334,136
4,334,201
4,334,250
42 : 4,333,185
4,333,189
4,333,198
4,333,232
4,333,236
4,333,248
4,333,304
4,333,310
4,333,343
4,333,352
4,333,422
4,333,486
4,333,510
4,333,551
4,333,590
4,333,643
4,333,646

4,333,662
4,333,702
4,333,707
4,333,803
4,333,885
4,333,906
4,333,914
4,333,963
4,333,969
4,333,970
4,334,016
4,334,075
4,334,084
4,334,113
4,334,228
4,334,266
4,334,275
4,334,278
44 : 4,333,218
4,334,210
45 : 4,333,454
4,334,121
47 : Re.30,962
4,333,235
4,333,270
4,333,365
4,333,608
4,333,913
4,333,974
48 : 4,333,187
4,333,209
4,333,242
4,333,257
4,333,268
4,333,282
4,333,287
4,333,316
4,333,317
4,333,364
4,333,406
4,333,492
4,333,527
4,333,530
4,333,537
4,333,542
4,333,644
4,333,679
4,333,691
4,333,692
4,333,728
4,333,764
4,333,778
4,333,783
4,333,799
4,333,824
4,333,828
4,333,833
4,333,843
4,333,846
4,333,966
4,334,092
4,334,093

4,334,094
4,334,140
4,334,171
4,334,191
4,334,192
4,334,227
4,334,256
4,334,268
4,334,280
4,334,293
4,334,296
4,334,302
49 : 4,333,430
4,333,555
4,333,623
4,333,637
4,333,698
4,333,739
4,334,287
50 : 4,333,808
4,334,292
51 : 4,333,263
4,333,398
4,333,482
4,333,483
4,333,484
4,333,758
4,333,951
4,334,107
4,334,322
53 : 4,333,243
4,333,272
4,333,373
4,333,384
4,333,396
4,333,423
4,333,498
4,333,534
4,333,566
4,333,621
4,333,675
4,333,922
4,334,204
54 : 4,333,284
4,333,445
4,333,852
4,333,858
4,334,112
55 : Re.30,960
4,333,210
4,333,251
4,333,267
4,333,309
4,333,421
4,333,425
4,333,466
4,333,573
4,333,932
4,333,956
4,333,979
4,334,072
4,334,153

DESIGN PATENTS

01 : 264,844
264,875
04 : 264,843
05 : 264,862
06 : 264,766
264,770
264,789
264,797
264,815
264,822
264,824
264,828
264,842
264,851
264,858

264,865
264,866
264,867
264,869
264,878
264,879
264,881
264,886
08 : 264,765
264,852
09 : 264,808
12 : 264,877
13 : 264,798
17 : 264,774
264,817

264,826
18 : 264,769
20 : 264,806
264,839
24 : 264,772
264,787
25 : 264,791
264,792
264,794
264,870
264,880
26 : 264,834
264,835
264,836
27 : 264,777

264,778
264,779
264,833
264,887
29 : 264,849
34 : 264,776
264,793
264,805
264,847
264,872
36 : 264,771
264,773
264,775
264,781
264,783

264,810
264,816
264,840
264,861
264,873
264,876
37 : 264,780
264,784
264,785
264,888
264,889
39 : 264,811
264,812
264,813
264,856

41 : 264,857
44 : 264,820
47 : 264,868
48 : 264,795
264,796
264,827
51 : 264,790
264,818
53 : 264,841
55 : 264,786
264,819
264,883
264,884
264,885

PLANT PATENTS

06 : 4,855
4,856

U.S. GOVERNMENT PRINTING OFFICE : O—1982

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ Domestic; @ $ Foreign.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

(IF FOREIGN) COUNTRY

PLEASE PRINT OR TYPE

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office Stop
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER my SUBSCRIPTION TO

S.S. Domestic @ $ Foreign

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

(IF FOREIGN) COUNTRY

PLEASE PRINT OR TYPE

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No.

MAIL ORDER FORM TO: Superintendent of Documents Government Printing Office Washington, D.C. 20402

U.S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, *Secretary*
PATENT AND TRADEMARK OFFICE
Gerald J. Mossinghoff, *Commissioner*